(1)

ENVIRONMENTAL ASSESSMENT

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

(2)

FEBRUARY 1991

US Army Corps
of Engineers
Rock Island District

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DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT. CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
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REPLY TO
ATTENTION OF

February 21, 1991

Planning Division

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Enclosed for your review is a copy of the Environmental Assessment (EA), Clean Water Act Section 404(b)(1) Evaluation, and a draft Finding of Significant Impact (FONSI) addressing the proposed major maintenance of Lock and Dam 16, Rock Island County, Illinois, and Muscatine County, Iowa.

The EA is being circulated for a 30-day public review period, commencing from the date of this letter. If, at the end of the 30 days, no comments are received that alter the determination that no significant environmental impact will result, the FONSI will be signed and kept on file at the Rock Island District, Corps of Engineers, office.

Please send any comments to the address listed below:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

John R. Brown
Colonel, U.S. Army
District Engineer

Enclosure

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

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MUSCATINE COUNTY, IOWA

BACKGROUND. Lock and Dam 16 is a component of the inland waterway navigation system of the Upper Mississippi River Basin. Construction, operation, and maintenance of these facilities were authorized by the River and Harbor Act of 1930. Construction of Lock and Dam 16 was completed in 1937.

An Environmental Impact Statement was prepared for *Operation and Maintenance of the Upper Mississippi River Nine-Foot Channel Project, Pools 11 Through 22*, with the Statement of Findings filed with the Council on Environmental Quality on January 28, 1975.

In 1978, the Inland Waterways Authorization Act (Public Law 95-502) was signed into law. Section 101 of the Act directed the Upper Mississippi River Basin Commission to prepare a *Comprehensive Master Plan for the Management of the Upper Mississippi River System* in cooperation with appropriate Federal, State, and local officials.

The *Comprehensive Master Plan* identified certain measures, both structural and nonstructural, that may lead to increases in navigation capacity. However, the proposed maintenance/rehabilitation of Lock and Dam 16 covered by this Environmental Assessment includes maintenance and construction work to existing lock and dam features, such as concrete removal and replacement and electrical equipment replacement. As a result, the rehabilitated facilities will retain operating and performance characteristics similar to their original design. Hence, no changes in local or system river traffic or capacity can be attributed to the proposed rehabilitation addressed in this assessment. At such time as any new construction features are proposed for the sites, they will be evaluated as to their impact on local and system traffic and any resulting cumulative environmental impacts.

The U.S. Army Corps of Engineers, North Central and Lower Mississippi Valley Divisions; St. Paul, Rock Island, and St. Louis Districts are currently engaged in planning and construction activities on the Upper Mississippi and Illinois Rivers for the purpose of repairing and updating components of the navigation system on these rivers. Various site-specific environmental documents have been, or are being, prepared which discuss localized effects to natural and cultural resources from rehabilitation of Locks and Dams 2 through 22 on the Upper Mississippi River; and Lockport, T. J. O'Brien, Marseilles, Peoria, and LaGrange Locks and Dams on the Illinois River. A Programmatic Environmental Impact Statement (PEIS) was prepared to assess the environmental impacts to the Upper Mississippi River System (UMRS) from the major maintenance rehabilitation effort. The majority of the maintenance/rehabilitation work has consisted of repair

and replacement items. However, certain measures were identified as having the potential to increase navigation traffic and possibly cause cumulative impacts to the UMRS.

The Rock Island District conducted a traffic analysis in the PEIS to ascertain whether operation of the proposed measures would be likely to increase commercial navigation, which would lead to system-wide (cumulative) impacts on the UMRS. The traffic analysis concluded that during the navigation season and by the year 2040, a 1.3 percent increase in system traffic, or about 2.1 million tons, would occur with the proposed measures in place, versus without the proposed measures. This traffic increase translates into an average increase of about one tow per week on the Illinois Waterway, and about two tows per week on the Mississippi River. It would be difficult to measure this small increment in traffic from the environmental impact viewpoint. Also, this small increase in traffic is within the normal variability of any navigation season. The District concluded that this increase in system traffic during the navigation season caused by the proposed measures would not result in system-wide or cumulative impacts to the UMRS that are measurable over existing conditions. The Final PEIS was distributed for public review in March 1989, and the Record of Decision was signed on July 28, 1989.

ENVIRONMENTAL ASSESSMENT

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

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ENVIRONMENTAL ASSESSMENT

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

I. PURPOSE AND NEED FOR ACTION.

Completed in 1937, Lock and Dam 16 has surpassed the 50-year lifespan typically estimated for concrete structures of this type. Maintenance of the facilities is needed to retain operating and performance characteristics similar to their original design.

II. PROJECT DESCRIPTION.

Lock and Dam 16 is located at river mile 457.2 on the Mississippi River, just north of Muscatine, Iowa. The location of the facility is shown on Plate 1 - Project Location.

The facilities are described as follows:

* The lock chamber is 110 feet wide by 600 feet long, with a maximum lift of 9.0 feet.

* The dam has a total length of 3,940 feet, consisting of a gross length of 1,099 feet of movable or gated sections, 415 feet of non-overflow earth dike sections, 726 feet of overflow earth dam sections, and a 1,700-foot ogee concrete spillway. The movable or gated section adjoins Lock 16 and is located across the main channel. The dam contains 4 roller gates and 15 tainter gates, together with appurtenant piers, sills, aprons, service bridge and operating machinery, and control houses. Five of the tainter gates, located adjacent to the lock, are separated from the remainder of the tainter gates by the 4 roller gates, which are situated at about mid-channel. The non-overflow section is formed by a 204-foot-long storage yard.

The proposed activity involves a variety of construction-type work such as concrete removal and replacement, steel work, sandblasting, painting, mechanical equipment replacement, and electrical equipment replacement.

Details of the proposed rehabilitation plan are as follows:

A. Lock Walls.

The lock walls will be repaired by removing the deteriorated concrete in the lock chamber and around the miter gates and replacing it with new concrete and armor. The armor will consist of horizontal runs of steel T-section and horizontal and vertical steel corner protection.

B. Main Lock Miter Gates.

There are two sets of miter gates at the main lock. The upper gates are 23 feet high, and the lower gates are 27 feet high. The gates are riveted steel frame structures covered with steel buckle plate. The upper and lower gates will be overhauled and painted.

C. Emergency Lock Miter Gates.

The emergency lock miter gates are a single gate set similar to the upper gates of the main lock, but are silted in on the upstream and downstream sides. The silt (fine sediment) will be removed on the upstream and downstream sides of the miter gates, and the gate leaves will be overhauled and painted. These gates were installed during original construction to provide a 6-foot draft structure for passage of emergency repair craft in the event of failure of the main lock. There will be no change in the use of these gates.

D. Lock Miter Gate Machinery.

The existing machinery will be removed and replaced with new machinery.

E. Lock Tainter Valve Machinery.

The existing machinery will be removed and replaced with new machinery and the tainter valves will be cleaned and painted.

F. Lock Electrical Equipment.

The existing electrical equipment, including the lighting system, will be removed and replaced with new equipment.

G. Dam Structure.

The dam piers will be repaired by removing the deteriorated concrete and replacing it with new concrete. The inside and outside of the trunnion boxes will be cleaned and painted. The operating houses will be rehabilitated by replacing with windows and repairing the deteriorated roof. Additional scour protection will be placed above and below the dam.

H. Roller Gates and Tainter Gates.

The insides and outsides of the roller gates will be cleaned and painted, the side seal plates will be repaired, and the rubber seals will be

replaced. The upstream and downstream surfaces of the tainter gates will be cleaned (sandblasted) and painted, as will structural framework. The lower portion of the roller gate lifting chain will be replaced with a new manually lubricated chain. The tainter gate chains will be replaced with a new type of log chain.

I. Dredging and Scour Protection.

Accumulated silt deposits on the upstream side the emergency lock will be removed to a placement site located on the Hog Island shoreline adjacent to the dam. Sand deposits upstream and downstream of the dam will be removed to a levee washout just downstream from the lock on the left descending bank. The Hog Island silt site will be used as a secondary site for sand placement. Total material removed will be approximately 15,000 cubic yards (yd^3) (plate 4).

Scour protection rock will be used to line, or armor, existing bottom contours around the dam. Approximately 40,000 yd^3 of material will be used (plate 3).

Upstream rockfill	9,000 yd^3
Downstream rockfill	16,000 yd^3
Upstream derrick stone	8,000 yd^3
Downstream derrick stone	6,500 yd^3

III. ALTERNATIVES.

Alternatives which were considered include:

A. Primary Rehabilitation.

1. No Federal Action. This alternative was not selected because the facilities are approaching the limits of their serviceable life. Rehabilitation of Lock and Dam 16 is authorized by the River and Harbor Act of July 3, 1930.

2. Rehabilitation of the Facility to Original Design Specifications or Criteria. This alternative was not selected because review of the facilities under the Major Rehabilitation Program and the Dam Safety Assurance Program indicated that certain features are outdated and/or unsafe. This alternative would eliminate the need for dredging/excavation for scour protection.

3. Rehabilitation of the Facility to Updated Specifications and Criteria. This is the preferred alternative and is shown in detail on plate 2.

B. Dredged Placement Sites.

1. No Federal Action. Nonremoval of sediments upstream from the emergency lock facility will prohibit maintenance and use of the lock facility. Therefore, this alternative is not acceptable.

2. Landside of the Upper Guidewall. This site is dominated by arrowhead (*Sagittaria latifolia*) and smartweed (*Polygonum punctatum*). This area was not selected because of the presence of the wetland indicator species.

3a. Hog Island Adjacent to the Dam. This is the preferred site for silt placement. The bank has been cut away during high water. Under a different project, *Environmental Assessment for Hog Island Bank Protection, Lock and Dam 16 and Huron Chute Closing Dam Modification, Pool 18* (July 1990), this site has been approved for placement of riprap for bank protection. Dredged material from this rehabilitation project would be placed landside of the riprap protection. This site would serve as a secondary site for sand placement if needed.

3b. The Left Descending Bank Downstream from the Lower Guidewall. This is the preferred site for sand placement. This site has experienced erosion caused from prop wash of tows waiting to enter the lock. Sand placement, shaping, and riprap protection will restore the portion of levee washed out by the waiting tows.

IV. AFFECTED ENVIRONMENT.

A. Natural Resources.

Lock and Dam 16 is situated in an aquatic resource-rich environment which developed indirectly from the dam's construction in 1937. The value of these aquatic resources is due partly to the variety of habitats which occur in close proximity to each other. Waters immediately upstream from the dam are relatively deep and slow. Bottom substrata are predominantly silt with occasional woody debris. Rooted aquatic vegetation also is present along shorelines and submerged islands upstream from the dam. These areas provide an important food source for migratory waterfowl and serve as spawning and nursery habitat for several fish species. Waterfowl hunters and commercial and recreational fishermen regularly use lower Pool 15.

Similar to other dams along the river, the Lock and Dam 16 tailwater is an important commercial and recreational fishery resource. The interspersion of turbulent and quiet water provides ideal feeding, resting, and spawning habitat for white bass, walleye, sauger, paddlefish, and freshwater drum. The spillway area between Hog Island and the Iowa shore has a similar fishery.

A commercially important mussel bed exists from the tailwater to approximately one-half mile downstream. As many as 19 species of mussels may be present in this bed, based on results of a mussel survey done by Lopinot (1977). [1]

From December through March, the dam tailwaters and shoreline of Hog Island are regularly used by wintering bald eagles as feeding and roosting areas. Tailwaters provide a plentiful supply of fish which, during extended cold spells, may be the eagles' only source of food. Eagle watching at Lock and Dam 16 is also a popular winter activity for many people.

B. Cultural Resources.

In 1985, the U.S. Army Corps of Engineers' 1927-1940 Upper Mississippi River Nine-Foot Channel project was considered to be eligible for listing on the National Register of Historic Places (NRHP) since it possesses integrity of location, design, setting, materials, workmanship, feeling, and association as a significant national transportation system. It is the Corps of Engineers' policy to ensure that the overall historic character, integrity, and preservation of these significant qualities are preserved.

In 1987, a Programmatic Memorandum of Agreement (PMOA) was executed by the Corps of Engineers, the Advisory Council on Historic Preservation, and the Illinois, Missouri, Wisconsin, and Iowa State Historic Preservation Officers (SHPO's). The Programmatic Environmental Impact Statement entitled, *Major Rehabilitation Effort: Mississippi River Locks and Dams 2-22 and Illinois Waterway from La Grange to Lockport Locks and Dams* (PEIS 1989) delineates significant cultural resources, including the central control stations (PEIS 1989:EIS-88), addressed in the PMOA.

This PEIS also describes compliance with the PMOA by completion of historic, photographic, and architectural documentation for the Historic American Engineering Record (HAER) under direction of the National Park Service (PEIS 1989:99). The HAER documentation was completed by Rathbun and Associates, filed with the Library of Congress (accepted in November 1988), and sent to the SHPO signatories.

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[1] A. C. Lopinot, *A Survey of the Freshwater Mussels in Pool 17 of the Mississippi River Near Muscatine, Iowa*, prepared for Iowa-Illinois Gas and Electric Co., WAPORA, Inc., Charleston, Illinois, 1977, 37 pp.

V. ENVIRONMENTAL IMPACTS OF THE PREFERRED ACTION.

Effects of the preferred action on natural and cultural resources are summarized in table EA-1.

A. Socioeconomic Impacts of the Preferred Action.

1. Community and Regional Growth. No significant impacts to the growth of the community or region would be realized as a direct result of the project. However, the existence of a cost-effective, efficient transportation system provided by the Upper Mississippi River locks and dams has provided stimulus for growth of river communities and the entire Midwest Region. Maintenance of Lock and Dam 26 indirectly will help to provide for continued growth opportunities in Muscatine, Iowa, and the region.

2. Displacement of People. The proposed maintenance activities at Lock and Dam 16 would necessitate no residential relocations.

3. Community Cohesion. No impacts to community cohesion would be realized as a result of the project, given the limited residential or other development in the project vicinity.

4. Public Facilities and Services. Safety at the lock and dam facilities would improve following completion of the required maintenance. The rehabilitation would result in lower probability of service interruptions for maintenance and repairs, thus benefiting both commercial and recreational craft.

5. Life, Health, and Safety. The proposed maintenance activities would reduce safety threats to lock and dam personnel and towing industry personnel.

6. Property Values and Tax Revenues. Limited, short-term effects on property values or tax revenues would result from the proposed maintenance activities at Lock and Dam 16. Long-term effects on property values and tax revenues would be related to community and regional growth.

7. Business and Industrial Growth. An increase in business and industrial activity would be noticed during the rehabilitation process. A portion of this increase would be attributable to purchases made for the rehabilitation of the lock and dam. The remaining increase would result from purchases made by construction workers (e.g., meals, lodging).

The Lock and Dam 16 rehabilitation will require no business relocations.

TABLE EA-1

Effects of the Preferred Action
on Natural and Cultural Resources

Types of Resources	Authorities	Measurement of Effects
Air quality	Clean Air Act, as amended (42 U.S.C. 165h-7, et seq.)	No significant effect
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended	Not present in planning area
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531, et seq.)	No significant impacts anticipated
Fish and wildlife	Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.)	No significant effect
Floodplains	Executive Order 11988, Flood Plain Management	No significant effect
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.)	No significant effect
Prime and unique farmland	CEQ Memorandum of August 1, 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	No significant effect
Water quality	Clean Water Act of 1977, as amended (33 U.S.C. 1251, et seq.)	No significant effect
Wetlands	Executive Order 11990, Protection of Wetlands, Clean Water Act of 1977 as amended (43 U.S.C. 1857h-7, et seq.)	Present in planning area; preservation anticipated
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271, et seq.)	Not present in planning area

8. Employment and Labor Force. Rehabilitation of the lock and dam temporarily would increase area employment; an average of 100 workers would be employed for the maintenance efforts, with approximately 300 workers employed during the 2 peak months of construction. Workers would be hired through labor unions at Muscatine, Iowa, and other nearby communities.

Long-term impacts to employment or the labor force in the Muscatine, Iowa, area would be related to business and industrial growth.

9. Farm Displacement. No farms would be affected by the proposed construction activity and the lock and dam.

10. Noise. Heavy machinery would temporarily increase noise levels during project construction. The immediate project area features industrial, agricultural, and low density residential development. While construction noise potentially could disturb recreationists, it is unlikely that this noise level increase would significantly affect the surrounding population.

11. Aesthetic Values. The aesthetic appeal of any type of construction activity is low; however, construction will be temporary. The results of the proposed activity, (i.e., concrete repair, machinery replacement, painting, and lighting improvement), should improve aesthetic values at facilities over the long term.

C. Environmental Impacts of the Proposed Action.

1. Manmade Resources. Pools 16 and 17 above and below the project site, respectively, may be considered manmade resources since they are natural resources modified by man to facilitate waterborne commerce on the Upper Mississippi River. They are created and controlled by operation of the lock and dam in concern with other components of the Upper Mississippi River Nine-Foot Channel Navigation project. The facilities are manmade resources and are a vital part of the national infrastructure.

At this time, rehabilitation of the facilities is anticipated to maintain existing navigation conditions in Pools 16 and 17. Completion of the project should contribute to alleviation of existing problems involving degradation of manmade resources of the Upper Mississippi River Nine-Foot Channel Navigation project.

2. Natural Resources. The majority of project activities will take place on the facility structures themselves, and, therefore, will have a negligible effect on natural resources. Potential sources of impacts from a project of this nature involve sandblast residue, paint-solvent overspray, concrete debris, and metal scrap. Asbestos insulating coverings from electrical components will require special handling and disposal. Sandblast residue and paint overspray will be controlled by the use of tarps or other containment devices.

Concrete debris and metal scrap will be removed and disposed of in compliance with applicable statutes. *Guide Specification Civil Works Construction for Environmental Protection*, CW-1430, July 1978, provides for submission of an environmental protection plan by successful contractors. Further guidelines in this document call for the *Protection of Water Resources* (Sec. 7.4) and *Protection of Air Resources* (Sec. 7.5). Rock Island District staff will review the Environmental Protection Plan submitted by the successful contractor prior to commencement of project activities. Corps inspectors will monitor adherence to this plan.

Dredging activities at the emergency lock at Lock and Dam 16 will eliminate existing benthic populations. Composed primarily of accreted silt and clay, this benthic substrate would typically support a community of burrowing invertebrates such as mayfly larvae, chironomids, and diptera larvae. Following dredging and rehabilitation activities, sediment accretion is anticipated to resume on the upstream side of the emergency miter gates.

This area typically would be recolonized by invertebrates shortly thereafter. Sediment accretions on the downstream side of the emergency miter gates also are anticipated to resume.

Dredging activities above and below Dam 16 will eliminate benthic conditions at those areas. However, current velocities and flow patterns immediately above and below roller and tainter gate dams limit bottom-dwelling organisms to crevice-inhabiting invertebrates such as mayfly and caddisfly larvae. These forms survive in interstitial spaces provided by scour protection rock and adjacent coarse substrate.

Substrate to be dredged upstream and downstream of Dam 16 consists primarily of hard-packed sand, and, as such, would typically provide little usable habitat for anything other than burrowing invertebrates. It is anticipated that excavation of the existing substrate and replacement with rock fill will improve available invertebrate habitat and spawning and foraging habitat for certain fish species.

Where no excavation is necessary, scour protection rock will be used to line, or armor, existing bottom contours around each dam. No fishery habitat beyond the dam foundation, in the form of scour holes, will be lost to filling.

Dredging of silty material from the auxiliary lock is planned to be done with a deck-mounted crane and clamshell bucket. Dredging of material above and below Lock 16 may be done as above or with a hydraulic cutterhead dredge.

It is currently proposed that all dredged or excavated materials be placed at the sites noted in Section III - Alternatives (paragraph B.3.a.).

Wildlife use of the placement areas is primarily by transient herpetofauna, birds, and small mammals. The availability of similar habitat nearby and

eventual landscaping and construction indicate that effects of dredged placement will be minimal and temporary.

Winter work at the lock and dam may disrupt foraging behavior of migratory, or winter resident, bald eagles. The availability of foraging areas usually found at naturally occurring open areas, other locks and dams, and power station outlets indicates that foraging at Lock and Dam 16 is not critical to survival of that species.

3. Cultural Resources. No impacts to cultural resources are anticipated. On December 12, 1990, the Rock Island District obtained concurrence of a No Effect determination for the two dredged material placement sites from the Illinois State Historic Preservation Office (Appendix A). The primary placement site for silt has been previously coordinated with the SHPO and contains no historic properties, as documented in the Corps' *Environmental Assessment for Hog Island Bank Protection, Lock and Dam 16 and Huron Chute Closing Dam Modification, Pool 18* (July 1990). The primary placement site for sand is located laterally along a washout and eroded levee of the Drury Drainage District and will be shielded with riprap. On August 16, 1990, Corps Archeologist Ron Deiss visited this area, which was previously disturbed by levee construction and contains no historic properties.

This impact summary indicates that the major rehabilitation actions are required maintenance and proposed in compliance with the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Standards)*. Under Stipulation 2B of the Programmatic Agreement, the Corps determined that the work is in accordance with the Standards and will not affect any significant elements of the NRHP-eligible Upper Mississippi River Nine-Foot Channel project, nor any other eligible or NRHP-listed properties.

4. Air Quality. Impacts to air quality will occur from exhaust emissions, volatile paint solvents, fugitive particles from sandblasting, and dust particles from concrete removal and rock placement.

These impacts will be temporary and will not result in significant or permanent violations of air quality standards.

5. Water Quality. Construction materials will consist of physically stable and chemically noncontaminating material such as corrosion-resistant steel, concrete, and quarried limestone rock at Lock and Dam 16. Placing these materials at Lock and Dam 16 will require processing under Sections 401 and 404 of the Clean Water Act.

A Section 404(b)(1) Evaluation has been prepared for Lock and Dam 16 and is included in this report as Appendix B. Section 401 certification or waiver will be obtained from Illinois and Iowa agencies, as appropriate.

At Lock and Dam 16, the placement of construction materials and resuspension of normal bottom materials will contribute to localized, temporary

elevations in turbidity. While the contractor will be bound by the requirements and conditions set forth in *Guide Specification, Civil Works Construction for Environmental Protection*, CW-1430, July 1978, Section 7.3, certain loss of paint chips, residue, and other materials to the aquatic environment at the construction site is inevitable. Any effects, however, are anticipated to be minimal and short-term.

VI. COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES.

Compliance is summarized in table EA-2.

A. Endangered Species.

The following federally endangered and threatened species may be present in the project area:

Indiana bat	*Myotis sodalis*
Bald eagle	*Haliaeetus leucocephalus*
Higgins' eye pearly mussel	*Lampsilis higginsi*

The Indiana bat prefers habitat containing dead trees with loose bark to establish nursery sites. Caves are used in the winter for hibernation. The proposed work will not impact any of these types of habitat. No Indiana bats have been observed in the project area.

Bald eagles are generally limited to winter residency in the project area. Eagle use in the project area varies from winter to winter depending on ice conditions. Temporary disruption of eagle foraging behavior is the primary potential effect of construction activity around the project sites. Given the mobility of the species and the proximity of available foraging habitat throughout the study area, it is anticipated that disturbance of foraging birds will not affect the wintering bald eagle population.

While Higgins' eye pearly mussels have been documented in the study area, their presence at the project site is unlikely. Benthic disturbance in the tailwater area of the project facility is anticipated to have no effect on the endangered mussel species as well as other mussels.

The Illinois Department of Conservation stated by letter that lake sturgeon (*Acipenser fulvescens*) are found in Pool 16 the vicinity of the project. However, the proposed work should not adversely affect this species.

B. Cultural Resources.

According to Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), Federal agencies are required to avoid impacts if

TABLE EA-2

Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements

Federal Policies	Compliance
Archaeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not applicable
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 601, et seq.	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not applicable
National Environment Policy Act, 42 U.S.C. 4321, et seq.	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full compliance
River and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full compliance
Flood Plain Management (Executive Order 11988)	Full compliance
Protection of Wetlands (Executive Order 11990)	Full compliance
Environmental Effects Abroad of Major Federal Actions (Executive Order 12114)	Not applicable
Farmland Protection Act	Full compliance
Analysis of Impacts on Prime and Unique Farmland (CEQ Memorandum, 11 Aug 80)	Full compliance

NOTES:

a. Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or postauthorization).

b. Partial compliance. Not having met some of the requirements that normally are met in the current stage of planning.

c. Noncompliance. Violation of a requirement of the statute.

d. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

prudent and feasible measures can be found. Likewise, Federal agencies also are required to repair and maintain significant (or potentially significant) historic properties under their jurisdiction. Overall, the major rehabilitation program has been formulated to achieve both of these mandates. Most of the rehabilitation actions are minor in scope and will have no adverse effect on characteristics which contribute to the significance of the navigation system as a whole or individual structures within it.

Rehabilitation actions generally can be defined as major repair and maintenance items expected as a result of long-term wear and deterioration of aged features and requiring large capital and manpower investments beyond the capabilities of routine operation and maintenance. These and the improvement actions will not appreciably affect the overall appearance and operation of the navigation system. Many of the actions are necessary to ensure continued safe and efficient operation.

For the most part, rehabilitation actions will be unobtrusive, not visible to the public, and will not affect those characteristics which contribute to National Register significance.

Beneficial effects that will accrue include the general upkeep of the system and the extension of its operating life. Safety, national defense, energy efficiency, and economic benefits are not strictly historical but are certainly in the public interest. These benefits are those for which the system initially was constructed and thus become intangible elements contributing to the overall significance of the system, fulfilling the requirements set forth by the NHPA.

C. Federal Water Project Recreational Act.

The construction of the proposed project would have no effect on provisions of this act.

D. Fish and Wildlife Coordination Act.

The U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Iowa Department of Natural Resources, and Illinois Department of Conservation have been actively involved in this action. Letters of comment and telephone conversation records are reproduced in Appendix A.

E. Wild and Scenic Rivers Act.

No rivers listed as "wild and scenic" or rivers in the inventory for listing as "wild and scenic" will be affected by the project.

F. Executive Order 11988 (Flood Plain Management).

Executive Order 11988 directs Federal agencies to: (1) avoid development in the floodplain unless it is the only practical alternative; (2) reduce

the hazards and risks associated with floods; (3) minimize the impact of floods on human safety, health, and welfare; and (4) restore and preserve the natural and beneficial values of the floodplain. The proposed action is in accordance with Executive Order 11988.

G. Executive Order 11990 (Protection of Wetlands).

Executive Order 11990 directs Federal agencies to minimize the destruction, loss, or degradation of wetlands, and enhance the natural and beneficial values of wetlands when a practical alternative exists. Wetland definitions may apply to bottom land and shoreline areas within the project area. No wetland or bottom land hardwood areas will be affected by the currently proposed action.

VII. ENVIRONMENTAL IMPACTS OF OTHER ALTERNATIVES.

A. Primary Rehabilitation.

1. No Action. This alternative would allow the deterioration of the subject facility to a potentially inoperable condition.

Impacts could be incurred through loss of pool, flooding, rerouting of commodities to land-based transport, either short-haul around the facility or long-haul to final destination points, and a variety of other consequential activities resulting from the instability of Pool 16 and the remainder of the waterway system. Sediment would continue to fill the emergency lock, and scour hole development around the dam would continue. Regulation of each pool would be hindered by lack of control at the dam.

2. Rehabilitation of the Facility to Original Design Specifications or Criteria. Other than essentially the same short-term effects as noted for the preferred alternative (proposed action), there would be no overall change from existing conditions.

B. Dredging and Placement.

1. No Federal Action. Existing conditions would remain unchanged. Sedimentation would continue to fill the emergency lock area.

2. Landside of the Upper Guidewall. Dredged material placement here would eliminate approximately 1 acre of wetland dominated by arrowhead (*Sagittaria latifolia*) and smartweed (*Polygonum punctatum*).

VIII. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

Dredge work, rock placement, and activities by work vessels will disrupt the local aquatic environment at Lock and Dam 16. Benthic constituents

inhabiting the work areas will be disturbed. The period of aesthetic effect from dredged material placement will depend on the rate of vegetative establishment on the placement sites.

Considering the generally high fertility of the fine sediment, it is anticipated that revegetation will be rapid, and the period of aesthetic impact will be minimal. Temporary impacts to air and water quality are unavoidable.

The loss of 1 acre of trees will take place at the sand placement site, downstream from the lower guidewall. These trees, primarily box elder and silver maple, are on the existing levee and will be removed so that the levee can be reshaped to its original configuration. Routine maintenance of the levee includes tree removal; however, the existing trees are young and small and do not offer suitable eagle perches.

IX. RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

As a vital component in the national transportation infrastructure, Lock and Dam 16 will continue to serve navigation interests, as well as to maintain river aquatic and terrestrial habitat.

Without the short-term use of the environment for rehabilitation activities, the locks and dams will continue to deteriorate, eventually reaching unsalvageable condition.

X. ANY IRREVERSIBLE OF IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IF THE PROPOSED ACTION SHOULD BE IMPLEMENTED.

The property currently occupied by the lock and dam and formerly unpooled riverine habitat (pre-1930's condition) should be considered irretrievable for the life of the project. Time, labor, fuel, and other necessary construction materials also are irretrievable commitments.

XI. RELATIONSHIP OF THE PROPOSED PROJECT TO LAND-USE PLANS.

The operation and maintenance of Lock and Dam 16 do not conflict with any known Federal, State, or local land-use plans.

XII. CONCLUSIONS, CONTRIBUTIONS TO CUMULATIVE SYSTEM EFFECTS.

Environmental effects should not be significant. The project design will incorporate features to minimize or avoid impacts to natural and cultural resources. Dredged material placement has been, and will be, coordinated with appropriate Federal and State agencies. No project activities will take place prior to certification, or waiver or certification, under applicable purviews of the Clean Water Act.

The proposed maintenance/rehabilitation of Lock and Dam 16 involves maintenance and construction work to existing lock and dam features, such as concrete removal and replacement, steel work, sandblasting, painting, mechanical equipment replacement, and electrical equipment replacement.

Based on this analysis, the rehabilitation structures will retain operating and performance characteristics similar to their original design. Hence, no changes in local or system river traffic or capacity can be attributed to rehabilitation of the existing features of the locks and dams. At such time as new features are proposed for this site, they will be evaluated as to their impacts on local and system traffic and capacity.

XIII. COORDINATION.

Coordination for the project has been maintained with the following State and Federal agencies:

U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
Illinois Environmental Protection Agency
Illinois Department of Conservation
Iowa State Historic Preservation Officer
Advisory Council on Historic Preservation
Iowa Department of Natural Resources

The U.S. EPA raised several concerns during the scoping process of this project. (See conversation record in the Appendix A.) Some of these concerns have been addressed in the body of this EA, however, the following were not.

Erosion control will be implemented for any cofferdams used in the maintenance project. These dams will be made of chemically stable material and will be removed once rehabilitation is complete. Bulkheads will be used as cofferdams when lock repairs will be made and solid structural walls used during gate repairs. These facilities are chemically stable and will be removed once work is completed.

A staging area for contractor equipment will be established on existing parking lots and adjacent lawn areas. These areas are not environmentally sensitive and will be restored once the proposed work is completed.

FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT
FOR
LOCK AND DAM 16 MAJOR MAINTENANCE

I have reviewed the information provided by this Environmental Assessment, along with data obtained from Federal and State agencies having jurisdiction by law or special expertise, and from the interested public. I find that major maintenance of Lock and Dam 16 at Muscatine, Iowa, will not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later development.

Alternatives considered include: (a) no Federal action; (b) rehabilitation of the facility to original design specifications and criteria; and (c) rehabilitation of the facility to updated specifications and criteria.

Factors considered in making a determination that an Environmental Impact Statement was not required were as follows:

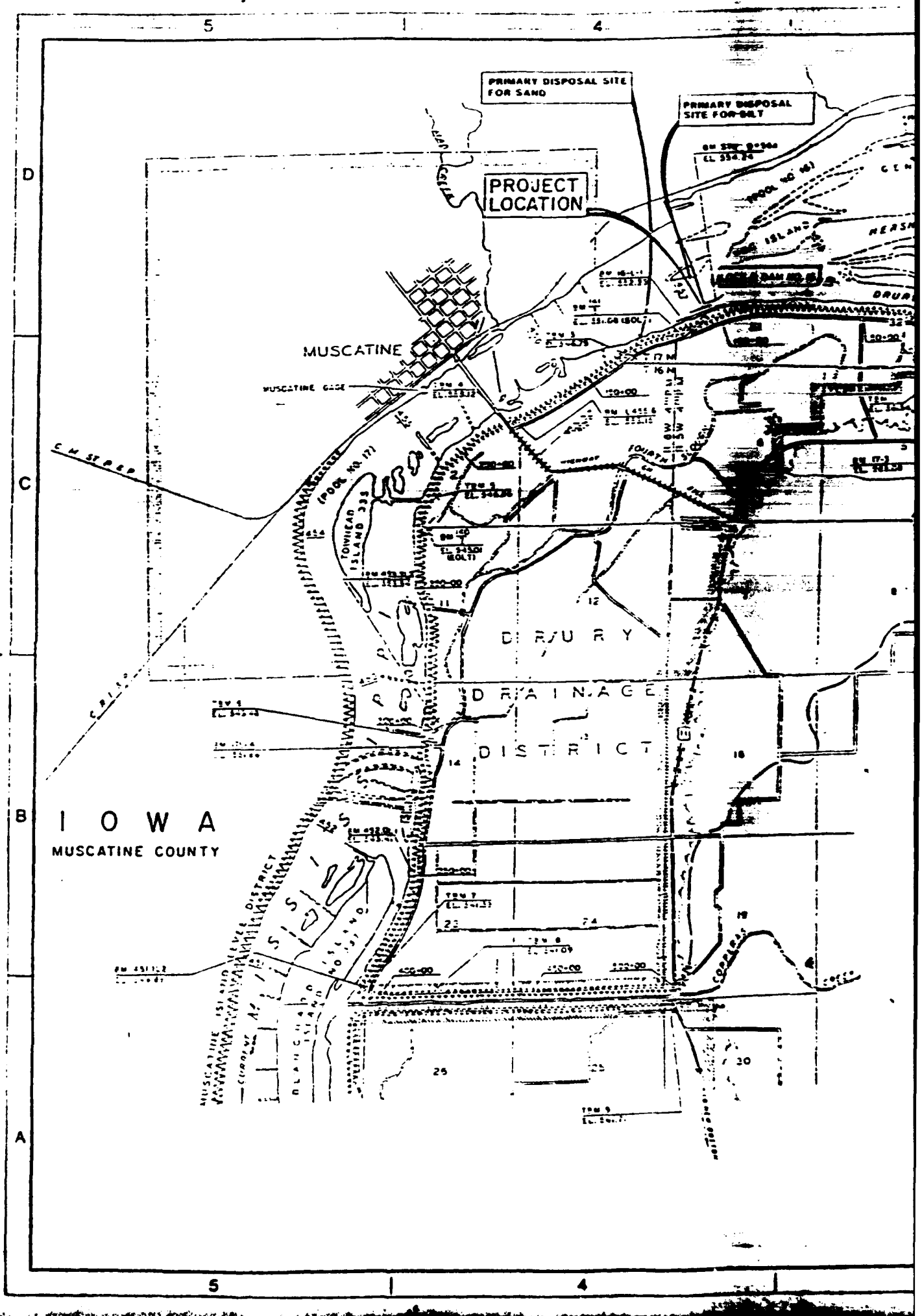
a. No long-term adverse impacts to natural or cultural resources are anticipated. No endangered species, either State or Federal, will be affected by the project action.

b. No expansion in tow traffic or the navigation capacity of the 9-foot channel will result from the proposed activity.

c. Land use after the project should remain unaltered, and no economic impacts to the project area are anticipated.

_____
Date

John R. Brown
Colonel, U.S. Army
District Engineer


PRIMARY DISPOSAL SITE FOR SAND
PRIMARY DISPOSAL SITE FOR SILT
PROJECT LOCATION
MUSCATINE
MUSCATINE GUIDE
TOWHEAD ISLAND 335
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DRAINAGE
DISTRICT
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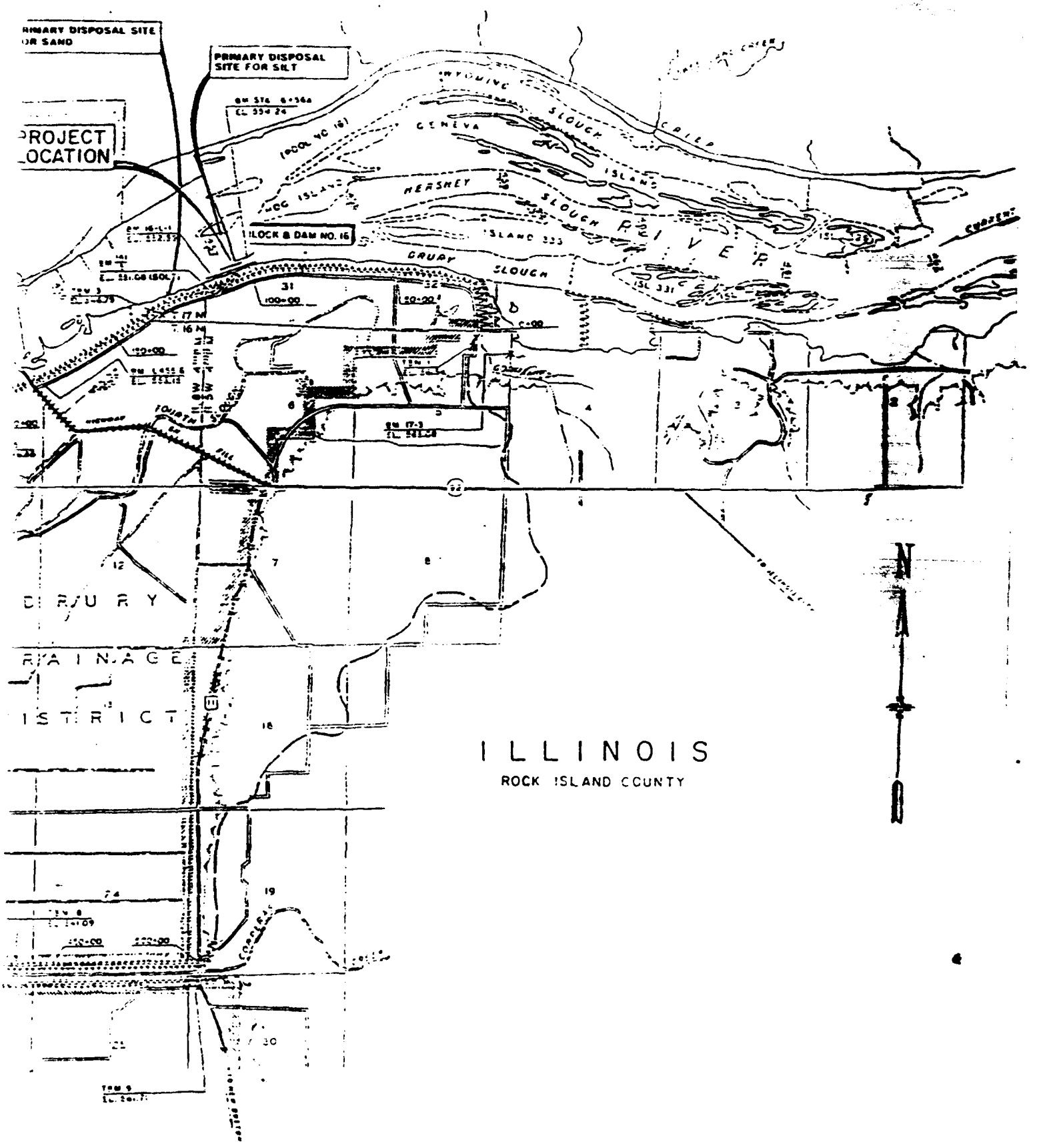
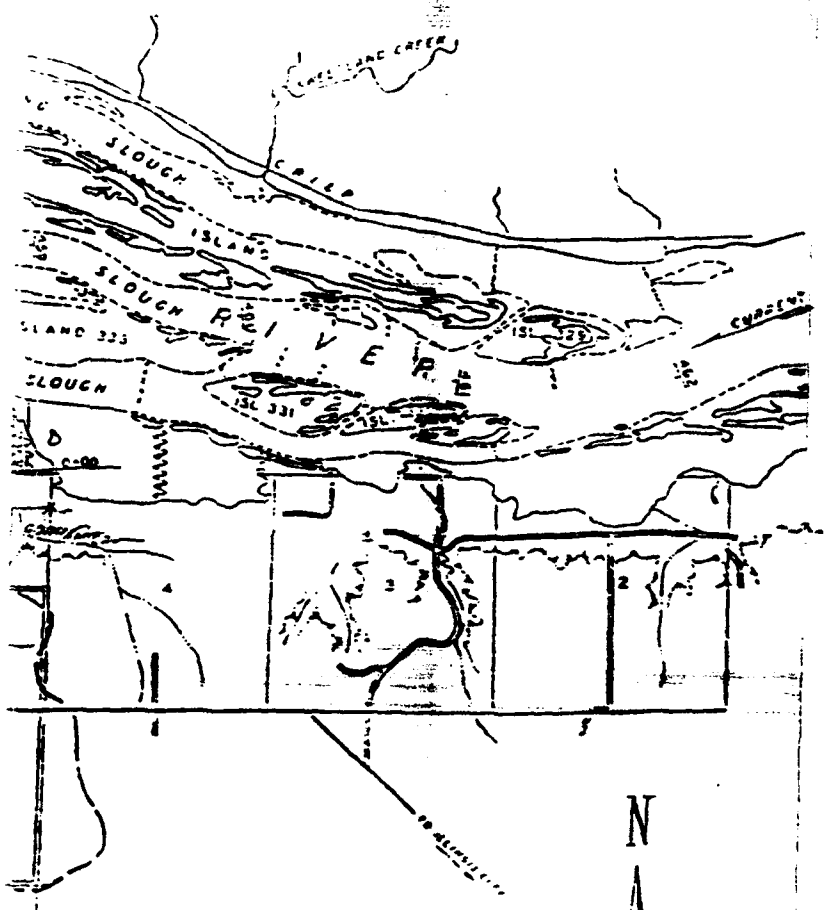
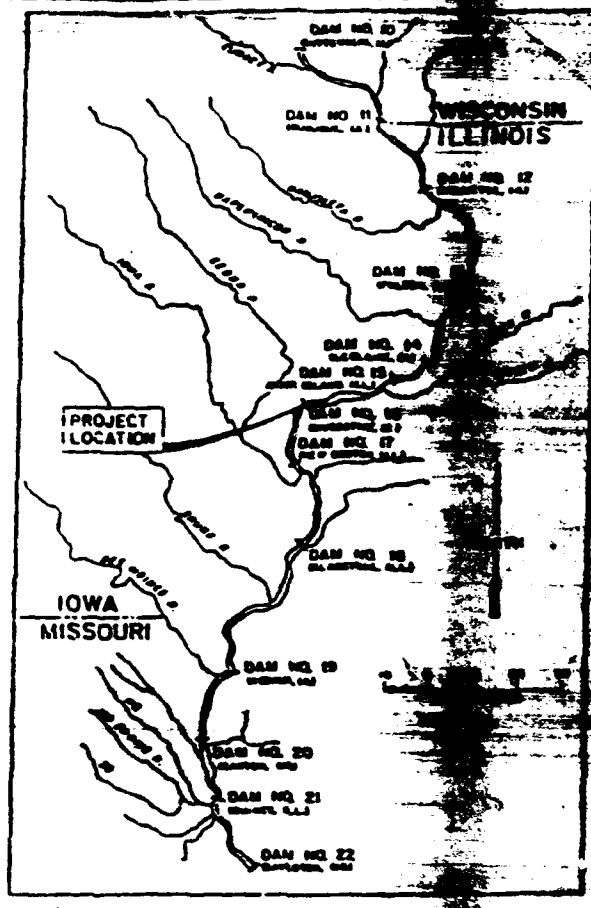

PRIMARY DISPOSAL SITE FOR SAND
PRIMARY DISPOSAL SITE FOR SILT
PROJECT LOCATION
GENEVA
ISLAND
HERSHEY
SLOUCH
RIVER
ISLAND 333
GRUBY
SLOUCH
LOCK & DAM NO. 16
ILLINOIS
ROCK ISLAND COUNTY
N



ILLINOIS

ROCK ISLAND COUNTY



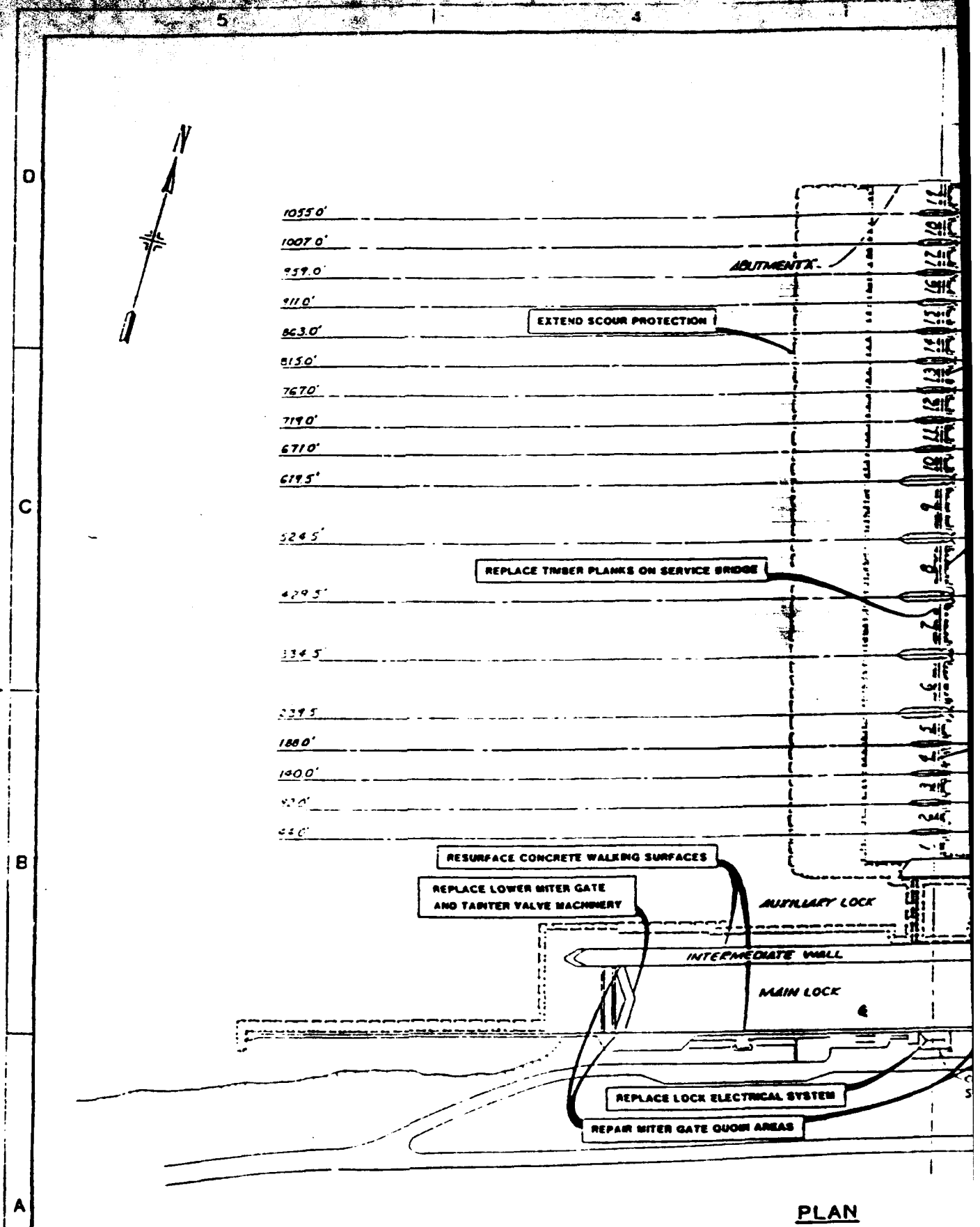
VICINITY MAP

SCALE IN FEET

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER
LOCK AND DAM NO. 18
MAJOR MAINTENANCE

PROJECT LOCATION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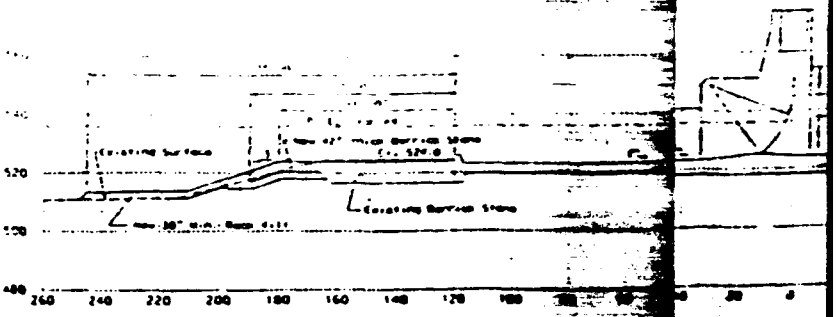
719.0'
671.0'
619.5'
524.5'
429.5'
334.5'
239.5'
188.0'
140.0'
ABUTMENT X
EXTEND SCOUR PROTECTION
REPLACE TIMBER PLANKS ON SERVICE BRIDGE
RESURFACE CONCRETE WALKING SURFACES
REPLACE LOWER MITER GATE AND TAINTER VALVE MACHINERY
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
REPLACE LOCK ELECTRICAL SYSTEM
REPAIR MITER GATE QUOIN AREAS
PLAN



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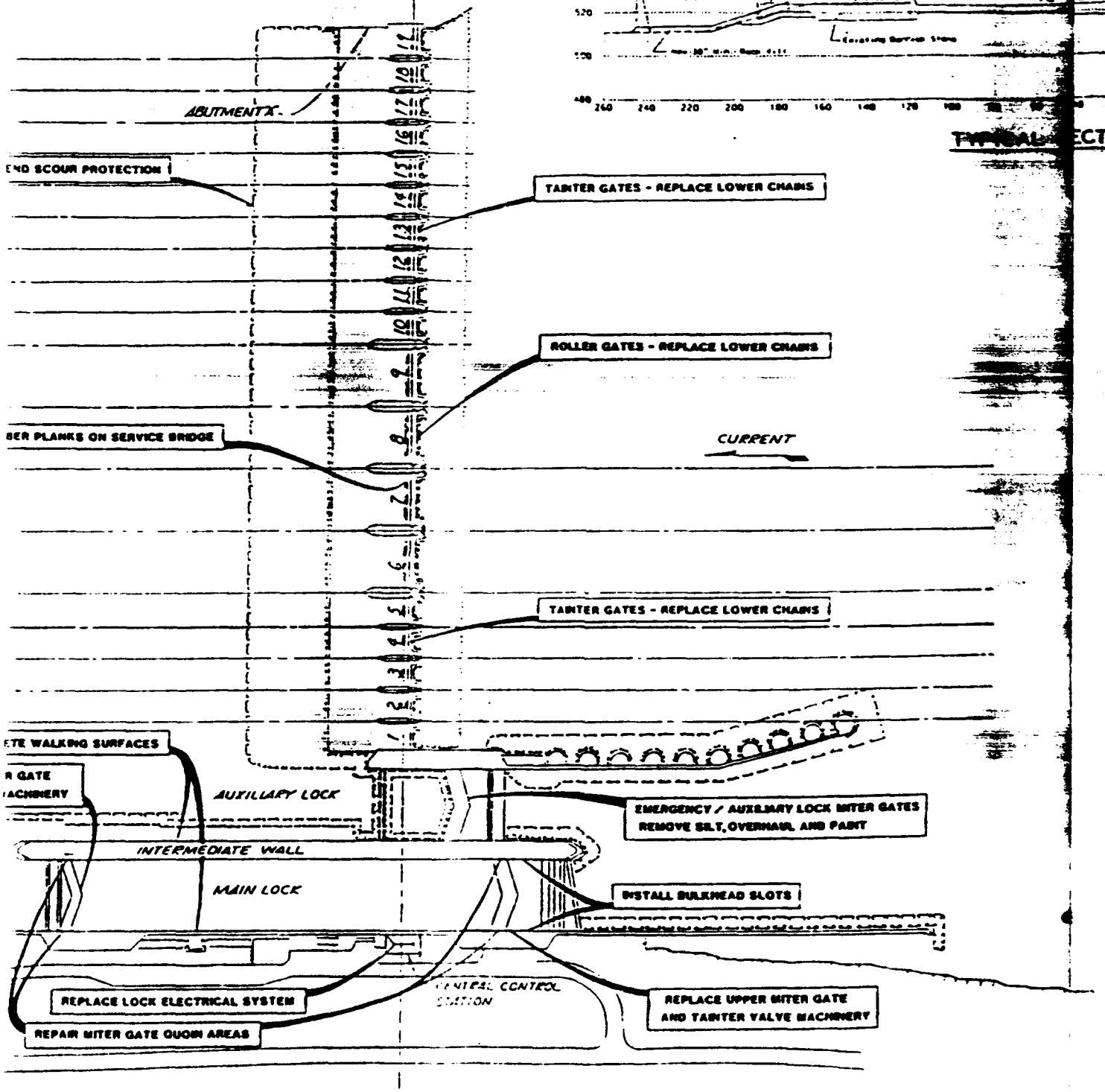
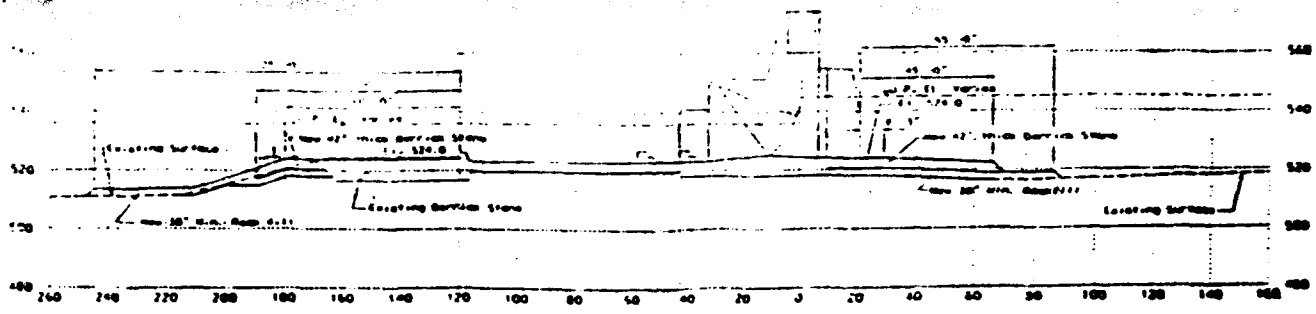


PLAN



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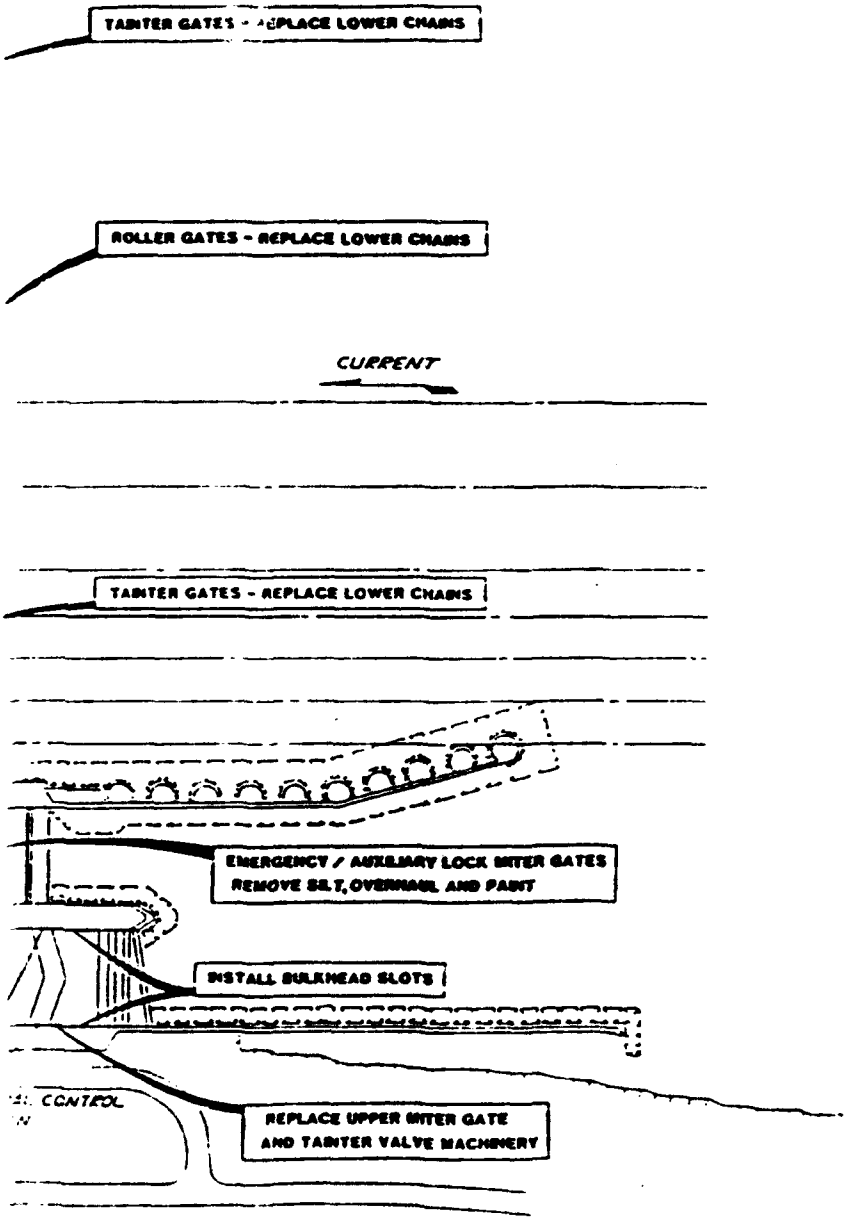


Symbol	Description	Date	Approved

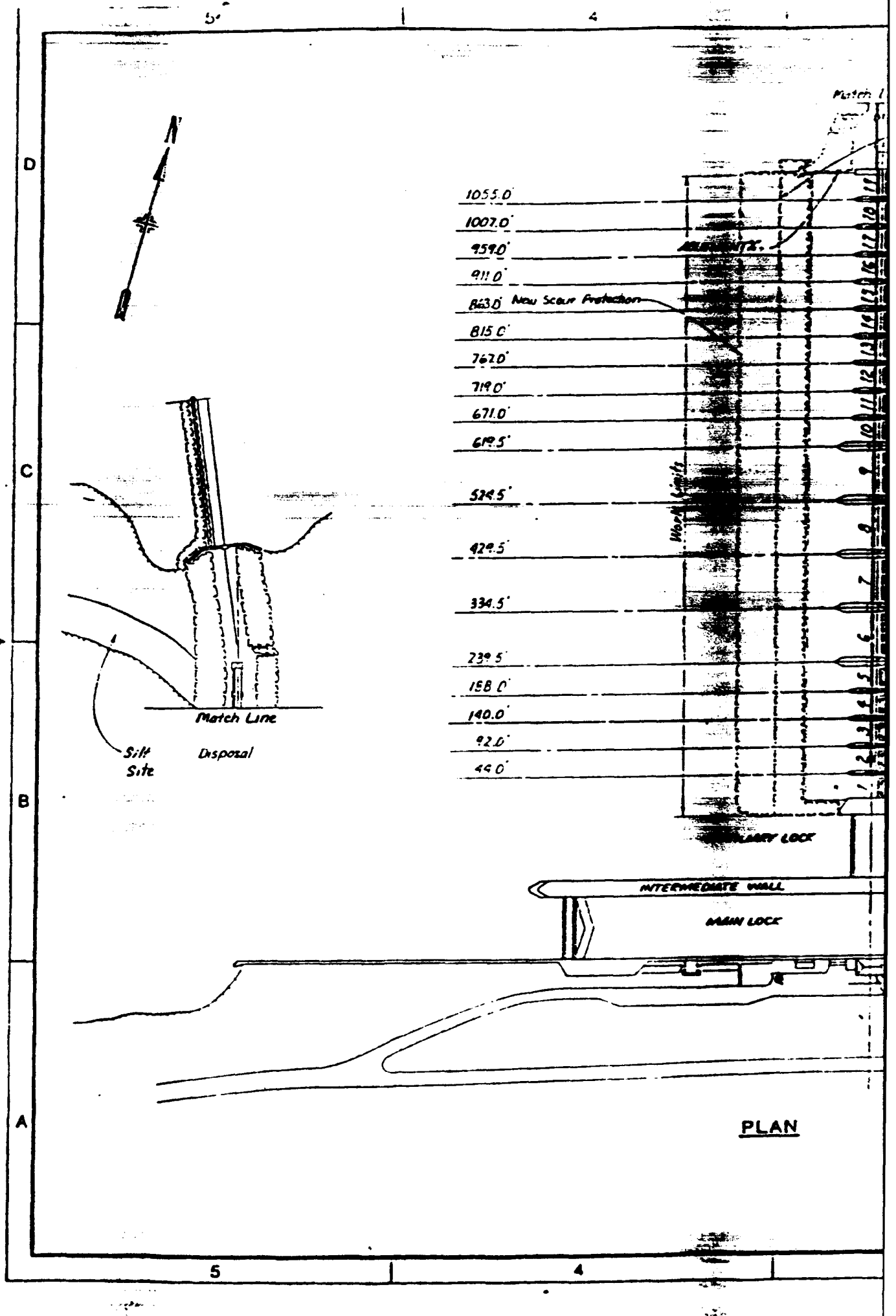
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER
LOCK AND DAM NO. 16
MAJOR MAINTENANCE

GENERAL PLAN

Scale 1" = 100'

PLATE 2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New Scour Protection
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767.0'
719.0'
671.0'
619.5'
524.5'
429.5'
334.5'
239.5'
188.0'
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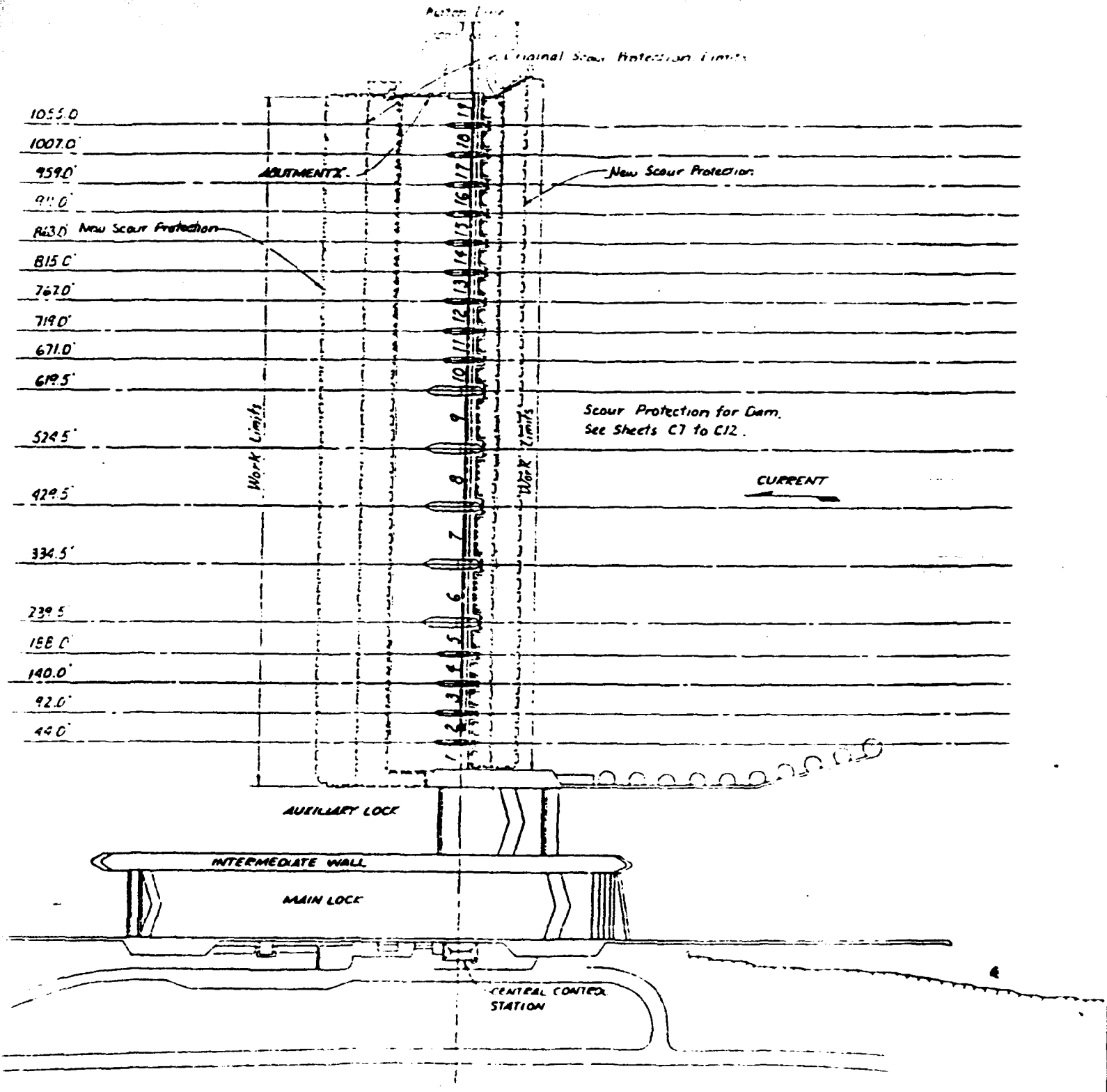
44.0'
Match Line
Silt Disposal Site
INTERMEDIATE WALL
MAIN LOCK
PLAN


Original Scour Protection Limits
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1007.0
959.0
911.0
863.0
New Scour Protection
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719.0
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619.5
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429.5
334.5
239.5
188.0
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44.0
ABUTMENT X
New Scour Protection
Work Limits
Work Limits
Scour Protection for Cam.
See Sheets C7 to C12.
CURRENT
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
CENTRAL CONTROL
STATION

PLAN

4 3 2

...inal Scour Protection Limits

New Scour Protection

Scour Protection for Dam.
See Sheets C7 to C12.

CURRENT

WORK LIMITS

...TRAL CONTROL
...TION

GENERAL NOTES

1. GOVERNMENT OWNED UTILITIES WILL NOT BE MADE AVAILABLE TO THE CONTRACTOR.
2. THE LOCK AND DAM ARE TO REMAIN IN OPERATION DURING THE CONSTRUCTION PERIOD EXCEPT AS NOTED IN THE SPECIFICATIONS.
3. REFERENCE DRAWINGS ARE DRAWINGS OF RECORD, INCLUDED SOLELY FOR THE CONTRACTORS BENEFIT. NO REQUIRED WORK UNDER THIS CONTRACT IS BASED ON THE REFERENCE DRAWINGS. BECAUSE THE DRAWINGS ARE NOT "AS-BUILT", THEY DO NOT NECESSARILY REPRESENT ACTUAL FIELD CONDITIONS. REFERENCE DRAWINGS ARE NOT PLOTTED TO SCALE.
4. ALL ELEVATIONS ON THESE DRAWINGS ARE BASED ON THE GENERAL ADJUSTMENT (1913).
5. THE CONTROL HOUSES AND MISCELLANEOUS LOCK FURNISHINGS ARE NOT SHOWN ON THE GENERAL PLAN.
6. ALL ELEVATIONS AND DIMENSIONS SHALL BE VERIFIED BEFORE FIELD REPAIR WORK BEGINS.
7. SEE REFERENCE SHEET(S)FOR BORINGS ADJACENT TO THE DAM. THESE BORINGS ARE FROM THE ORIGINAL CONSTRUCTION DRAWINGS. THERE IS NO CURRENT CLASSIFICATION OF THE MATERIAL TO BE ENCOUNTERED FOR THE ADDITIONAL SCOUR PROTECTION. IT IS ANTICIPATED THAT THE MATERIAL WILL BE MOSTLY SAND; HOWEVER, BOULDERS AND GRAVEL MAY BE ENCOUNTERED.
8. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO THE LOCK AND DAM FACILITY BY HIS CONSTRUCTION CONTRACT.
9. A STAGE II MAJOR REHAB CONTRACT FOR THE LOCK CHAMBER WALL IS ANTICIPATED TO BE AWARDED IN THE FALL OF 1991. THE CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH THE STAGE II CONTRACTOR TO MINIMIZE INTERFERENCES.
10. THE AVAILABLE STORAGE AND PARKING AREAS ARE FOR USE. CONTRACTORS USE PROVIDED THE AREAS ARE PUT BACK TO ORIGINAL CONDITION. NO TENT OR SERVICE SHALL BE ERECTED OR PARKED IN THESE AREAS.
11. POOL ELEVATIONS VARY. SEE SHEETS C3 TO C4 FOR HYDROLOGIC DATA.
12. DELIVERY OF ROCK TO THE PROJECT SITE SHALL BE ACCOMPLISHED BY BARGE TRANSPORTATION.
13. CONTRACTORS WILL NOT BE GIVEN PRIORITY OVER OTHER NAVIGATION USERS FOR LOCKAGES NECESSARY DURING THE CONTRACT. OBSERVATION OF NORMAL GUIDING PROCEDURES IS REQUIRED UNLESS OTHERWISE PERMITTED BY THE LOCKMASTER.
14. THE DATA CONTAINED IN THESE HDC TO PLANS ARE INTENDED TO CHARTE NATURAL MIGRATION AND SEDIMENTATION OF [illegible] BED.

No.	Description	Date	Approved

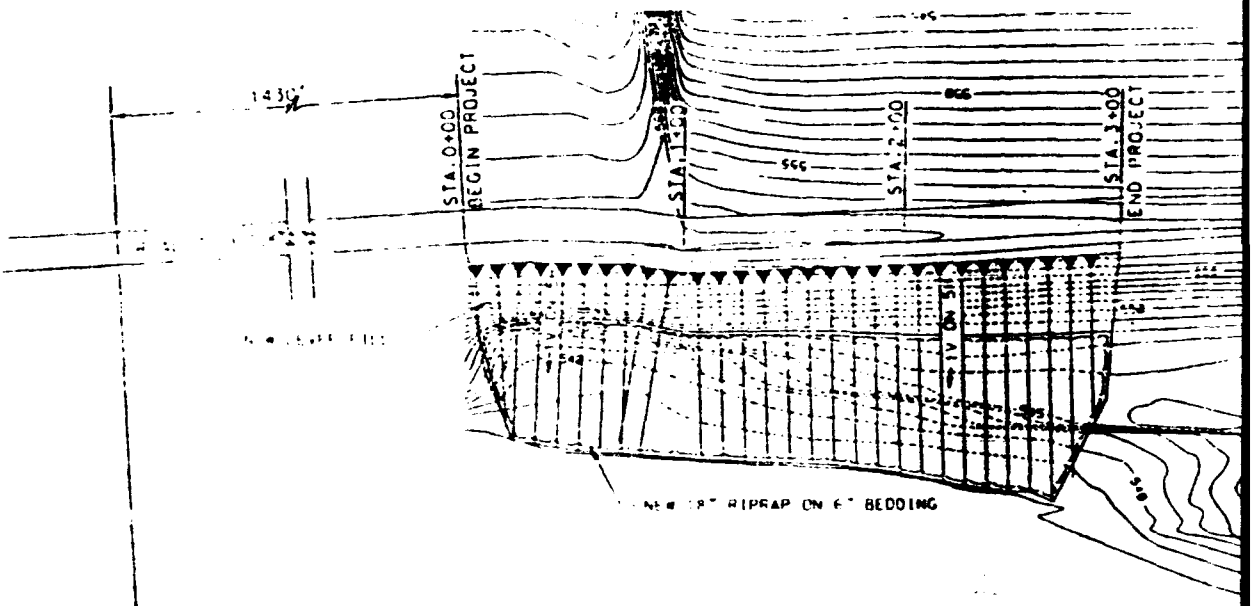
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

Designed by F.R.J.
Drawn by J.W.C.
Checked by D.A.L.
Quantities by D.L.L.
Approved by JOHN R. BROWN
CHIEF, CORPS OF ENGINEERS

MISSISSIPPI RIVER
LOCK AND DAM NO. 16
MAJOR MAINTENANCE
STAGE I
GENERAL PLAN

Scale 1"=100'
Date 27 AUG 1990
Drawing Code 90-L-16/125
C2
Contract No. DACW25-91-C-0002
Sheet 2 of

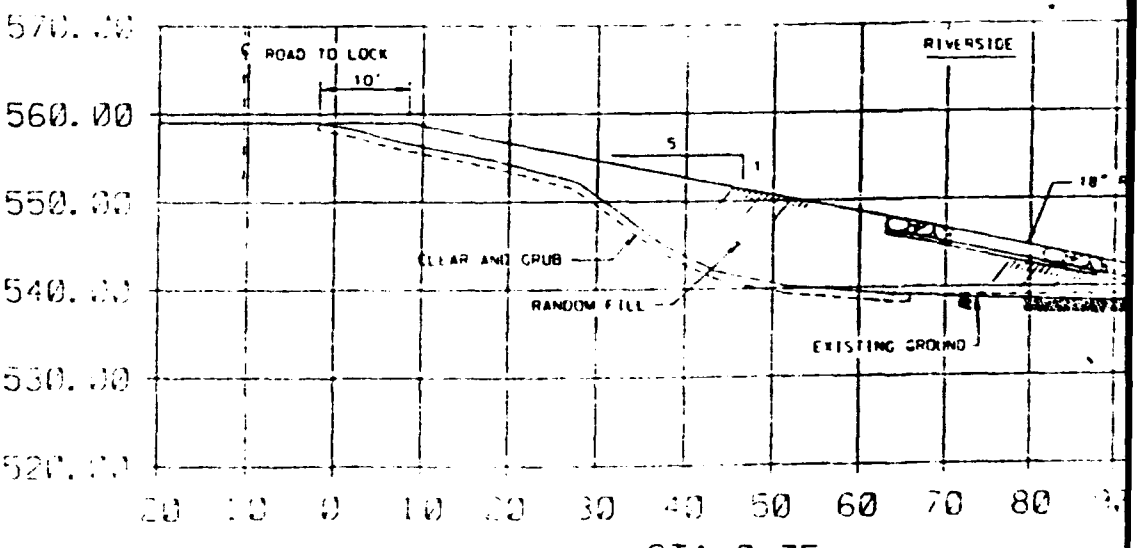
PLATE 3



PLAN

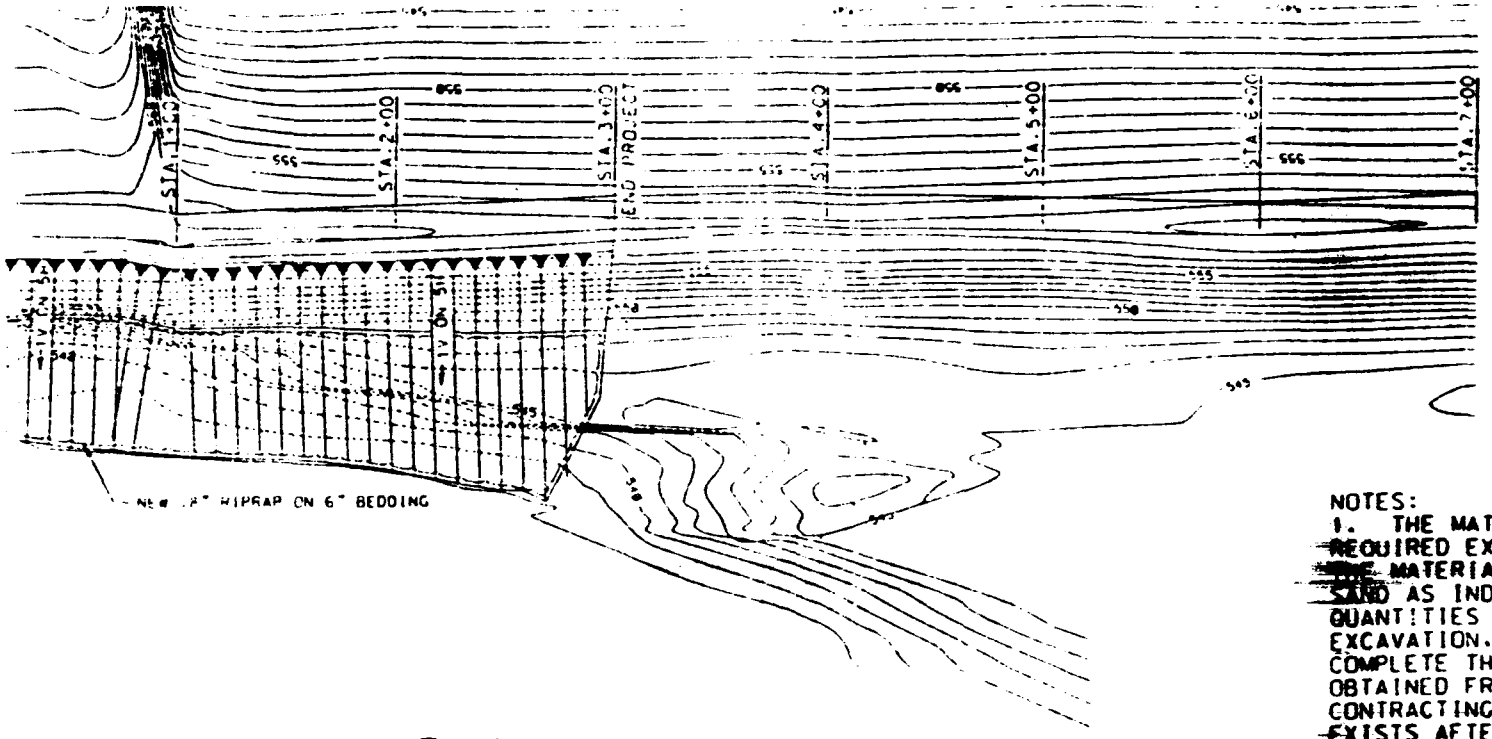
MISSISSIPPI RIVER

FLOW



STA. 0+75

TYPICAL SECTION



PLAN

RIVER

NOTES:
1. THE MATERIAL F
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THE MATERIAL TO BE
SAND AS INDICATED
QUANTITIES OF SAND
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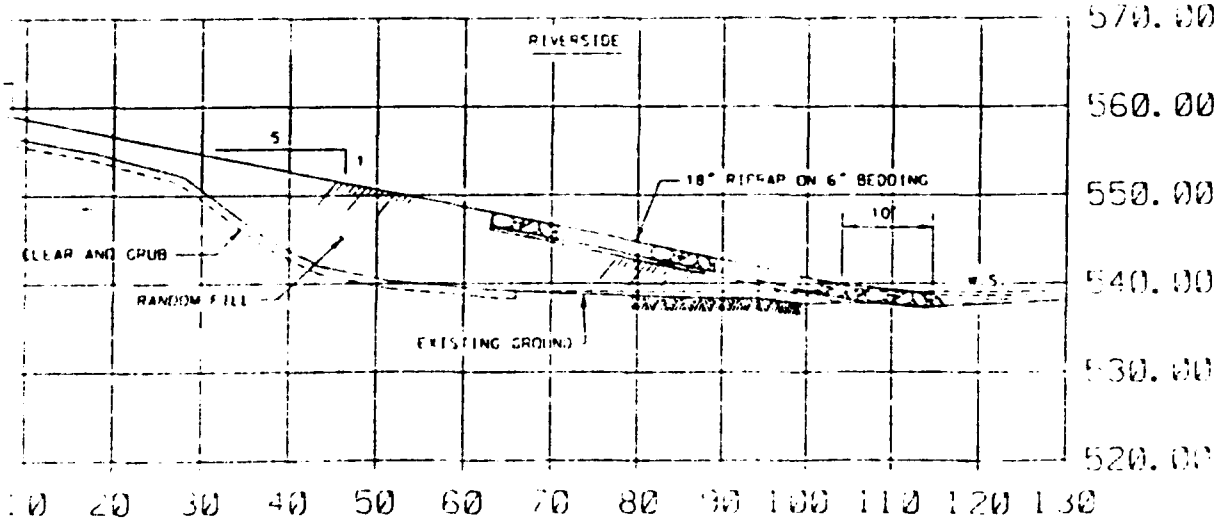
COMPLETE THE LEVEE
OBTAINED FROM AREA
CONTRACTING OFFICE
EXISTS AFTER COMPL
SHALL BE PLACED IN
2. THE LEVEE REPA
TO NAVIGATION TRAF
ACCESS ROAD TO THE
3. THE ROCK PLACE
THE EXISTING RIPRA
4. THE TAILWATER
DATA SHEETS C3 TO



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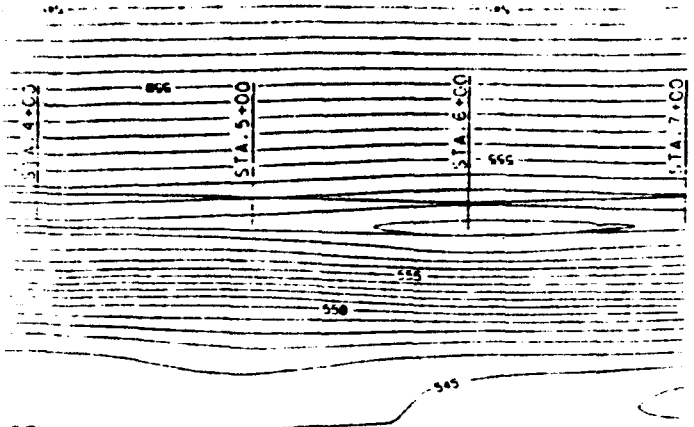
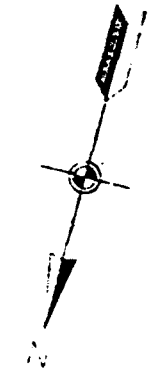
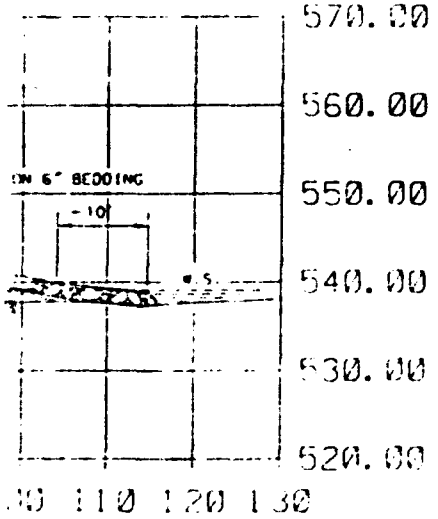
TYPICAL SECTION





NOTES:
1. THE MATERIAL FOR THE LEVEE REPAIR SHALL COME FROM THE REQUIRED EXCAVATION FOR THE ADDITIONAL [illegible] PROTECTION. THE MATERIAL TO BE USED IN THE LEVEE REPAIR SHALL BE CLEAN SAND AS INDICATED IN THE SPECIFICATIONS. IF INSUFFICIENT QUANTITIES OF SAND ARE OBTAINED FROM THE REQUIRED EXCAVATION, ADDITIONAL SAND MAY HAVE TO BE EXCAVATED TO COMPLETE THE LEVEE REPAIRS. THIS ADDITIONAL SAND SHALL BE OBTAINED FROM AREAS BELOW THE DAM AS APPROVED BY THE CONTRACTING OFFICER. IF A SURPLUS OF EXCAVATED MATERIAL EXISTS AFTER COMPLETION OF THE LEVEE REPAIR, THIS MATERIAL SHALL BE PLACED IN THE SECONDARY DISPOSAL SITE.
2. THE LEVEE REPAIR SHALL BE COMPLETED WITHOUT INTERFERENCE TO NAVIGATION TRAFFIC OR LOCAL VEHICULAR TRAFFIC ON THE ACCESS ROAD TO THE LOCK.
3. THE ROCK PLACEMENT ON THE LEVEE REPAIR SHALL TIE IN TO THE EXISTING RIPRAP AT APPROXIMATE STATION [illegible].
4. THE TAILWATER IS SUBJECT TO FLUCTUATIONS. SEE HYDRAULIC DATA SHEETS C3 TO C6 FOR DETAILS.



Revisions			
Symbol	Description	Date	Approved

US ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

Designed by
Drawn by
Checked by
Reviewed by
Approved by

MISSISSIPPI RIVER
LOCK AND DAM NO. 16
MAJOR RAHABILITATION
STAGE I

LEVEE REPAIR

Scale 1"=40'
Date 00 XXX 90
Drawing Code
Sheet reference number
Specification Number DACW25 91 B 0002
Sheet 00 of

3 | 2 | 1

PLATE 4

APPENDIX A

PERTINENT CORRESPONDENCE

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT. CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
ROCK ISLAND. ILLINOIS 61204-2004

REPLY TO ATTENTION OF

November 13, 1990

Planning Division

IHPA REVIEW
H/A Concur — BC
AC
AR Concur 12-10-90 jm
File

RECEIVED
NOV 19 1990
PRESERVATION SERVICES

Mr. Theodore H. Hild
State Historic
Preservation Office
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704

Dear Mr. Hild:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) requests concurrence of a No Effect determination for two dredge disposal sites proposed for the major maintenance of Lock and Dam 16 of the National Register of Historic Places (NRHP) Upper Mississippi River 9-Foot Channel Project. Lock and Dam 16 is located at river mile 457.2, Rock Island County, Illinois (plate 1).

In 1985, the Corps' 1927-1940 Upper Mississippi River 9-Foot Channel Project was considered eligible to the NRHP, since it possesses integrity of location, design, setting, materials, workmanship, feeling, and association. The policy of the Corps is to ensure that the overall historic character, integrity, and preservation of these significant qualities are preserved (plate 2).

A Programmatic Memorandum of Agreement (PMOA) was executed in 1987 by the Illinois, Missouri, Wisconsin, and Iowa State Historic Preservation Officers, the Advisory Council of Historic Preservation, and the U.S. Army Corps of Engineers for Locks and Dams 2 through 22. Programmatic Memorandum of Agreement stipulation 3(B) states that when coordination with the appropriate State Historic Preservation Officer (SHPO) results in agreement, the Corps may proceed with the agreed upon action.

The Final Programmatic Environmental Impact Statement: Major Rehabilitation Effort, Mississippi River Locks and Dams 2-22, Illinois Waterway from La Grange to Lockport Locks and Dams (March 1988) delineates significant cultural resources, including the central control stations (EIS-98). This document also describes compliance with the PMOA by completion of historic, photographic, and architectural documentation for the Historic American

Engineering Record (HAER) under direction of the National Park Service (EIS-99). The HAER documentation was completed by Rathbun and Associates, filed with the Library of Congress, and sent to the SHPO signatories.

Except for the two proposed dredge disposal sites, the major maintenance of Lock and Dam 16 is covered by the March 1988 EIS, in compliance with the PMOA. Both proposed disposal sites for silt and sand will hold approximately 15,000 yards of accreted sediments dredged from the emergency lock and other actions incidental to the major maintenance.

The primary disposal site for silt has been previously coordinated with the SHPO for comment within the Corps and contains no historic properties, as documented in the Environmental Assessment for Hog Island Bank Protection - Lock and Dam 16 and Huron Chute Closing Dam Modification - Pool 18 (July 1990). The primary disposal site for sand is located laterally along a washout and eroded levee of the Drury Drainage District and will be shielded with riprap (plates 3 and 4). This area was visited on August 16, 1990, by Corps Archeologist Ron Deiss and has been previously disturbed by levee construction and contains no historic properties.

We request a No Effect determination for the two proposed disposal sites upon the NRHP Upper Mississippi River 9-Foot Channel Project, which will preserve and maintain its significant qualities, as accorded by the PMOA.

If you have any questions on the Corps proposed disposal sites, or the major maintenance of Lock and Dam 16, please call Mr. Deiss of our Environmental Analysis Branch at 309/788-6361, Ext. 6185. We request that your comments on this project be sent to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

CONCUR

By: _____
Deputy State Historic Preservation Officer

Date: [redacted] DEC 12 199

Sincerely,

Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosures

Illinois Department of Conservation
life and land together

LINCOLN TOWER PLAZA • 524 SOUTH SECOND STREET • SPRINGFIELD 62701-1787
CHICAGO OFFICE • ROOM 4-300 • 100 WEST RANDOLPH 60601
MARK FRECH, DIRECTOR - KATHY SELCKE, ASSISTANT DIRECTOR

November 28,1990

District Engineer
U.S. Army Engineer District, Rock Island
Clock Tower Building - P.O. Box 2004
Rock Island, IL 61204-2004

Attn: Planning Division

Dear Colonel Brown:

Department staff here reviewed Mr. Dudley Hanson's October 5, 1990 letter concerning the major maintenance of Lock and Dam 16 of the Mississippi River 9-Foot Navigation project. Incidental actions to major maintenance are the dredging and disposal of some 15,000 cubic yards of accreted sediment around the lock and dam.

Relative to state listed threatened and endangered species, the threatened Lake Sturgeon (Acipenser fulvescens) have been taken fairly regularly by commercial fishermen in Pool 16 during the last few years. Planned work on the lock and dam and disposal of sediments in the designated areas should not have adverse effects on Lake Sturgeon.

The Department concurs that the use of the planned disposal sites should not result in significant impacts to the area's fish and wildlife resources.

Thank you for the opportunity to comment.

Sincerely,

Mark Frech
Director

MF:RWL:ts

cc: USFWS, Rock Island

CONVERSATION RECORD	TIME 1425	DATE 17 December 1990

TYPE ( )VISIT ( )CONFERENCE (x)TELEPHONE (x)INCOMING ( )OUTGOING

CF:

NAME CONTACTED	ORGANIZATION	TELEPHONE
Al Fennidick	US EPA Reg 5	(312) 886-6872

SUBJECT: Lock and Dam 16 Major Maintenance, Rock Island County, Illinois, Muscatine County, Iowa

SUMMARY:

1. Mr. Fennidick returned my earlier call. I was seeking comments to an initial scoping letter (dated 5 October 1990) concerning SAB.

2. Mr. Fennidick had several recommendations the Corps should address in the Environmental Assessment (EA) currently being written.

a. Erosion control should be implemented for any coffer dams used during rehabilitation.

b. Any coffer dams will should be constructed with chemically stable material, and should be removed once the project work is complete.

c. Controls will be used to capture fugitive dust, oil, grease, paint chips, etc.

d. If significant impacts are to occur as a result of the project, mitigation is to be used to recoup lost habitat, or impacts to the environment.

e. A staging area to park and store equipment will not be placed in an environmetnally sensitive area.

f. The above reccomendations not only be implemented into the EA, but the contract language as well.

3. I thanked Mr. Fennidick for his comments and reassured him the comments would be implemented into the EA.

ACTION REQUIRED Impliment comments into the EA and contract language.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Joseph W. Jordan	Joseph W. Jordan	17 December 1990

ACTION TAKEN Required action completed.

SIGNATURE	TITLE	DATE
Joseph W. Jordan	Biologist	17 December 1990

50271-101 CONVERSATION RECORD (12-76)

CONVERSATION RECORD	TIME 0830	DATE 19 December 1990

TYPE ( )VISIT ( )CONFERENCE ( )TELEPHONE ( )INCOMING (x)OUTGOING

CF:

NAME CONTACTED	ORGANIZATION	TELEPHONE
John Fleckenstein	IDNR	(515)281-8967

SUBJECT: Lock and Dam 16 Major Maintenance, Rock Island County, Illinois, Muscatine County, Iowa

SUMMARY:

1. I called Mr. Fleckenstein regarding the IDNR's comments concerning the above subject and if the IDNR has any State threatened and endangered species concerns with the above project.

2. Mr. Fleckenstein stated the IDNR had no threatened and endangered species concerns with the project as proposed.

3. For other concerns the IDNR may have, Mr. Fleckenstein transferred me to Mr. Darryl Hayes.

ACTION REQUIRED

Implement comments into the Environmental Assessment.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Joseph W. Jordan	Joseph W. Jordan	19 Dec. 1991

ACTION TAKEN

Comments added to Environemtal Assessment.

SIGNATURE	TITLE	DATE
Joseph W. Jordan	General Biologist	16 Jan. 1991

CONVERSATION RECORD	TIME 1130	DATE 16 January 1991

TYPE ( )VISIT ( )CONFERENCE ( )TELEPHONE ( )INCOMING (x)OUTGOING

CF: ----------

NAME CONTACTED	ORGANIZATION	TELEPHONE
Darryl Hayes	IDNR	(515)281-8675

SUBJECT: Lock and Dam 16 Major Maintenance, Rock Island County, Illinois, Muscatine County, Iowa

SUMMARY:

1. I called Mr. Hayes to follow-up on earlier conversations regarding the IDNR's comments concerning the above subject.

2. Mr. Hayes had consulted with Bernie Schonhoff, IDNR District Fisheries Biologist for the Muscatine area, for his concerns. Mr. Schonhoff's only concern with the project was the downstream mussel bed.

3. I reassured Mr. Hayes the mussel beds were addressed in the Environmental Assessment and the beds would not be disturbed as a result of the proposed work or the completed project.

4. Mr. Hayes stated the IDNR had no other concerns with the project as proposed.

ACTION REQUIRED
Implement comments into the Environmental Assessment.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Joseph W. Jordan	Joseph W. Jordan	16 Jan. 1991

ACTION TAKEN
Comments added to Environemtal Assessment.

SIGNATURE	TITLE	DATE
Joseph W. Jordan	General Biologist	16 Jan. 1991

50271-101 CONVERSATION RECORD (12-76)

CONVERSATION RECORD	TIME 1330	DATE 16 January 1991

TYPE ( )VISIT ( )CONFERENCE (x)TELEPHONE (x)INCOMING ( )OUTGOING

CF:

NAME CONTACTED	ORGANIZATION	TELEPHONE
Jody Millar	USFWS	(309)798-5800

SUBJECT: Lock and Dam 16 Major Maintenance, Rock Island County, Illinois, Muscatine County, Iowa

SUMMARY:

1. I called Ms. Millar regarding the USFWS's comments concerning the above subject and if the FWS has any Federally threatened and endangered species concerns with the above project.

2. I explained the project (dredging plans, disposal sites, scour protection, and facility repairs).

3. Ms. Millar stated she agrees with the Corps; the project will have no adverse effect on the fish and wildlife in the project area or on any threatened and endangered species in the project area.

ACTION REQUIRED

Implement comments into the Environmental Assessment.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Joseph W. Jordan	Joseph W. Jordan	19 Dec. 1991

ACTION TAKEN

Comments added to Environmental Assessment.

SIGNATURE	TITLE	DATE
Joseph W. Jordan	General Biologist	16 Jan. 1991

50271-101 CONVERSATION RECORD (12-76)

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

CENCR-PD-E

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

FEBRUARY 1991

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

APPENDIX B
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

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CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

LOCK AND DAM 16 MAJOR MAINTENANCE

ROCK ISLAND COUNTY, ILLINOIS
MUSCATINE COUNTY, IOWA

SECTION 1 - PROJECT DESCRIPTION

LOCATION

Lock and Dam 16 is part of the Upper Mississippi River System located at river mile 457.2, just north of Muscatine, Iowa (plate 1). The facility consists of one 600-foot main lock separated from the dam by an emergency/ auxiliary set of lock miter gates.

GENERAL DESCRIPTION

For Lock and Dam 16, the following activities require assessment in this Section 404(b)(1) Evaluation:

a. Dredging silt from the upstream and downstream sides of the emergency/auxiliary miter gates.

b. Dredging sand from the tailwater of the dam, in a strip roughly 75 feet wide, from the riverside lock wall to the end of the gated portion of the dam.

c. Dredging sand from the pool side of the dam, in a strip roughly 53 feet wide, from the riverside lock wall to the end of the gated portion of the dam.

Items b. and c. above are described on plate 2; however, some areas of this alignment will not require material removal. At Dam 16, some dredging is anticipated across most of the dam, with scour holes armored, instead of being filled to level grade.

Maintenance activities to commence following completion of items b. and c. will consist of placing rock bedding and capstone for scour protection above and below Dam 16.

AUTHORITY AND PURPOSE

The project is to be completed under the authority of the River and Harbor Act of July 3, 1930, which authorized the Upper Mississippi River Nine-Foot Channel Navigation project. Operation and maintenance of Lock and Dam 16 are included in that authorization.

The purpose of this action is major maintenance of the existing facility, which is a component of the Upper Mississippi River Nine-Foot Channel Navigation project. Lock and Dam 16 is a unit of the Inland Waterway Navigation System of the Upper Mississippi River Basin.

GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

Total material removed will be approximately 27,000 cubic yards (yd^3) at Lock and Dam 16 (table B-2). At Lock 16, approximately 15,000 yd^3 of fine sediment adjacent to the auxiliary gates will be removed and placed in the spoil site identified below in "Description of Proposed Discharge Sites." Sandy or coarse material removed will be placed at sites shown on plate 3 and are estimated to total 12,000 yd^3.

Material to be used for scour protection at Dam 16 will consist of derrick stone on rock fill. Rock typically used for riprap and fill is limestone and, as such, may be considered physically stable and chemically noncontaminating. Stone gradations and quantity estimates are shown below on tables B-1 and B-2, respectively.

TABLE B-1

Stone Gradations

Percent Smaller by Weight	Limits of Weights of Stone (lbs.)	
	Rock Fill	Riprap
100	400-200	2,000-950
50	180-90	830-460
15	50-25	400-200

TABLE B-2

Quantity Estimates (yd^3)
Lock and Dam 16

Material	Upstream	Downstream	Approx. Total
Rock fill	9,000	16,000	25,000
Derrick stone	8,000	6,500	14,500
Excavated sand	4,000	8,000	12,000
Fine sediments	--	--	15,000

Below Dam 16, the rock fill will be 2.5 feet thick and will extend 75 feet beyond the existing rock protection. The derrick stone will be placed on the rock fill at a thickness of 3.5 feet for a distance of 20 feet beyond the existing rock protection. The derrick stone above the dam will be placed on the rock fill at a thickness of 3.5 feet for a distance of 35 feet beyond the existing rock protection (plate 2).

DESCRIPTION OF PROPOSED DISCHARGE SITES

Plans for scour protection at Dam 16 involve packed sand substrate immediately upstream and downstream of the dam. Portions of this substrate will be excavated to vary in depth prior to discharge of rock fill and capstone.

Due to the location, water velocity generally reduces the bottom-dwelling, or benthic, community to the burrowing invertebrates. No mussel bed community is anticipated to exist under conditions typically found at or immediate to the stilling basin of a dam of this type.

Discharge of rock fill and capstone, for scour protection, will take place during low-flow periods typically encountered during the summer months. This work will require alteration of the dam regulation schedule to allow plant and equipment to work in the dam headwater and tailwater areas. Placement of rock fill and capstone may take up to 4 weeks, depending on river stages. Dredging with a mechanical dredge, transport, and placement of fine material from the auxiliary lock may take up to 6 weeks, depending on conditions encountered during the operation. It is currently planned to dredge during the summer months of 1991.

The site currently proposed for discharge, or placement, of excavated silty materials is on the Hog Island shoreline adjacent to the dam. This site has been approved for riprap bankline protection as part of another

project, *Environmental Assessment for Hog Island Bank Protection, Lock and Dam 16 and Huron Chute Closing Dam Modification, Pool 18* (July 1990). Materials will be deposited behind the bankline protection.

Another site has been proposed for sandy deposits. This site is located on the left descending bank downstream 1,430 feet from the lower guidewall adjacent to a levee. Currently, this site is experiencing erosion caused by prop wash from tows as they wait to enter the lock. Deposits will be placed in the levee washout and protected with riprap (plate 4).

DESCRIPTION OF PLACEMENT METHOD

Placement of material for scour protection typically involves the use of deck-mounted cranes and/or derricks, deck barges, endloaders, quarter boats, and tender craft. Materials are dumped to alignment and spread to profile. Large grade stone (i.e., derrick stone) is placed by crane or derrick. Placement of finer material from the auxiliary lock area will primarily involve the use of a deck-mounted crane and clamshell bucket. This material will be loaded on deck barges for transfer to placement site(s). Following stockpiling and drying, dredged material would be graded to elevations suitable for landscaping. Placement of all materials is planned for non-aquatic sites.

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

Lock and Dam 16 was constructed on Mississippi riverbed cross sections consisting primarily of sand, gravel, and finer alluvial material. The lock and dam was built on wooden piles driven into the riverbed.

Sediments accumulated over the period of operation of Lock and Dam 16 are primarily silts and clays in the emergency lock area, where slack water has allowed finer suspended material in the tailwaters of Dam 16 to vary from location to location across the profile. From the auxiliary lock river wall to the storage yard, little deposition typically occurs due to the higher velocities resulting from the use of the gates for pool level control. Sediments that accrete here would typically be coarse sand and larger material. During low-flow periods, the overflow sections of the dam create slack water areas where deposition of sand and finer material occurs. However, due to annual flushing during high water periods, percentages of fine material present at any time in this reach would be variable. Fine material percentages generally increase with distance away from the dam.

Deposition of rock fill and capstone across the upper and lower dam/ riverbed cross sections is intended to stabilize bottom components and reduce under-cutting of existing scour protection.

Placement of excavated/dredged material from Lock and Dam 16 is planned to occur in the summer months of 1991. Silty material will be placed behind bank protection riprap and will be groomed as described above under "Description of Proposed Discharge Sites." Coarser material will be placed on the levee site downstream from the lower guidewall. A secondary site for sand is the silty material site on Hog Island.

The placement of up to 15,000 yd^3 of fine sediments from the auxiliary lock area is of primary concern. These sediments have been analyzed for various chemical parameters, with results of analyses being shown on tables B-3 and B-4. Physical and chemical composition of this material was considered when selecting a placement site.

Grain size analysis results are given in table B-5. Sediment samples collected at all sites consisted primarily of silt and/or clay. At LD16-U1, LD16-U2, and LD16-D1, more than 80 percent of the material passed through a #230 sieve, while at LD16-D2, only 69.2 percent did.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

WATER

Water and sediment samples were taken during November 1990 (plate 5). These samples were taken in the auxiliary lock area and were analyzed for ambient water and elutriate parameters. Results were compared to Iowa water quality standards. Elutriate and ambient water test results are shown in tables B-3 and B-4, respectively.

Ambient water tests for heavy metals revealed no detectable levels except for lead and zinc. Although detectable, the lead and zinc levels were below State standards.

The elutriate test is used to simulate return flow conditions that would occur during dredged material placement.

Results from the elutriate analyses indicate that ammonia nitrogen (including its un-ionized form) would be the parameter of main concern if the sediment which has accumulated in the auxiliary locks were hydraulically dredged. The elutriate test results indicate that mercury concentrations exceed the State standard; however, all concentrations were at or below the detectable limit. Proposed mechanical dredging may serve to reduce effects by removing material quantities in bulk, rather than slurry form. However,

TABLE B-5

MISSISSIPPI RIVER
LOCK AND DAM NO. 16
SAMPLE DATE: 9 NOVEMBER 1990

GRAIN SIZE ANALYSIS OF SEDIMENT SAMPLES

SUMMARY OF TESTING

U.S. Standard Sieve Size or Number					
Sample No.	LD16-U1	(DUP) LD16-U1	LD16-U2	LD16-D1	LD16-D2
3/8"		100.0			100.0
# 4	100.0	99.9	100.0	100.0	99.9
# 8	99.9	99.8	99.9	99.9	99.8
# 16	99.7	99.6	99.8	99.7	99.2
# 30	99.5	99.4	99.6	98.7	96.3
# 50	97.4	97.2	97.7	93.8	84.8
# 70	95.2	95.0	95.3	91.4	78.9
# 100	91.4	91.3	91.5	88.8	73.9
# 200	85.9	85.5	83.1	84.0	69.9
# 230	84.6	84.3	81.4	83.0	69.2
	(a)	(a)	(a)	(a)	(a)

Notes:

1. Visual classification of soils as stated below is in accordance with "The Unified Soils Classification System (USCS)"

   (a) CL gray sandy lean clay

2. Laboratory testing was performed in accordance with EM 1110-2-1906 dated 30 Nov 70, revised 1 May 80 and 20 Aug 86. All samples were oven dried at 110 degrees centigrade. Sample designated (Dup) is a duplicate sample.

turbidity levels are typically higher at the work site with mechanical dredging.

If dredging were to occur during the fall or spring when water temperatures and pH values are lower, un-ionized ammonia nitrogen concentrations would be lower; therefore, there would be fewer violations of this standard. At this time, it is proposed to dredge during the summer months.

Sediment sampling and analyses centered around material anticipated to be primarily silt to clay-size particles. Typically, analysis of sand sediments, such as found immediately above and below Lock and Dam 16, reveals little evidence of pollutants due to the limited surface area of sand-size particles and the lack of strong chemical bonding of contaminants to sand grains. No pollutant analysis was performed on sandy material at Lock and Dam 16.

Any contaminants in sandy materials removed from the pool or tailwater would be those typically contained or transported by normal fluvial processes and therefore common constituents of the Mississippi River system. Placement of sandy material excavated from the dam area would therefore not be anticipated to alter water chemistry in the water column, as return water reaches the Mississippi River.

Clarity and turbidity of the river vary with seasonal flow. Placement sites and methods have been selected to minimize impacts to clarity, color, odor, taste, dissolved gas levels, nutrients, and biochemical oxygen demand in the riverine environment. Discharge of rock will stabilize finer substrate materials; terrestrial placement of fine silt and clay will minimize water quality impacts. Any return water reaching the bankline is anticipated to have only a localized, short-term effect. Bank material will be protected as necessary for erosion control during discharge flow.

Non-riverine originated components such as rock fill, capstone, concrete, and steel which may be placed temporarily or permanently during construction will be physically stable and chemically noncontaminating.

CURRENT PATTERNS AND CIRCULATION

Placement of rock fill and capstone for scour protection is not anticipated to negatively affect current patterns, velocity, stratification, and hydrologic regime in the river system. However, scour protection is anticipated to reduce local scouring caused by through-dam current patterns.

Terrestrial discharge of material excavated from the emergency lock should have no effect on hydraulic or hydrologic conditions in the project area. Terrestrial placement of sand material should not affect hydrologic or hydraulic conditions in the project area.

NORMAL WATER LEVEL FLUCTUATIONS

No effects on normal seasonal river stages are anticipated by the proposed actions.

SALINITY GRADIENTS

The proposed actions take place in and around an island freshwater stream system. Therefore, no consideration of salinity gradients is warranted for these actions.

ACTIONS TAKEN TO MINIMIZE IMPACTS

The use of chemically stable materials, physical stabilization of materials by design, and terrestrial placement of fine, silty material are actions intended to reduce impacts to the riverine system.

Proposed mechanical dredging of fine material is intended to reduce contaminant and sediment resuspension at the placement site, which typically occurs with hydraulic dredging.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

The discharge of rock for scour protection is anticipated to have only a minor, temporary effect as the material is placed and spread to design elevation.

Mechanical dredging in the auxiliary lock areas will result in locally increased turbidity. Analysis of turbidity at Lock and Dam 20 during cleanout of that auxiliary lock indicated elevations to 145 NTU against background levels of 79 to 84 NTU. All levels observed during dredging at Lock and Dam 20 are similar to naturally occurring turbidity levels during periods of high flow. Effects on the water column of the river system regarding light penetration, dissolved oxygen, toxic metals and organics, pathogens, and aesthetics are anticipated to be minimal and localized for a nominal distance downstream during the term of project construction.

Some potentially toxic materials have been identified in materials to be dredged from the river system. Concentrations of these materials in return water which could potentially exceed water quality standards for elutriate, are anticipated to be minimized through the dredge method for fine materials (mechanical) and the placement site selection (terrestrial) planned for this project.

DREDGING AND PLACEMENT

Effects on biota, including primary producers (i.e., zoo and phytoplankton, suspension/filter feeders, and sight feeders) are anticipated to be temporary and localized. Because the duration of increased turbidity levels is anticipated to be minimal, localized, and temporary, impacts to the aquatic community are anticipated to be negligible. The project component which will produce a habitat alteration, scour protection, is anticipated to provide long-term benefit by stabilizing finer sediments.

Impacts are anticipated to be minimized by placement site selection dredging methodology and the use of chemically noncontaminating and physically stable materials for project construction.

CONTAMINANT DETERMINATIONS

No dredged material contaminants have been identified which require special handling or treatment beyond that currently proposed for the project.

Contaminants identified from elutriate analysis are generally part of the modern riverine system and are commonly suspended, transported, and deposited through normal fluvial processes in the Mississippi River.

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

Because the likelihood of contamination by pollutants is generally low for projects involving rock placement and terrestrial disposal, impacts to the aquatic ecosystem are anticipated to be negligible.

Effects on plankton are anticipated to be minimal. Effects on benthos will be limited to elimination of those organisms currently inhabiting the immediate scour protection site. The placement of rock fill for scour protection should provide interstitial spaces for invertebrate population production and limited vertebrate spawning potential. Effects on nekton will be limited to displacement and temporary disruption of foraging patterns. Because the proposed activities are generally held to low-flow (hence, non-spawning seasons), impacts to spawning species should be negligible. Impacts regarding various behavioral patterns during winter high stress periods would be restricted to the project site due to ice coverage and resultant weather-related construction restrictions. Effects on the aquatic food web are expected to be negligible. Effects on special aquatic sites should be negligible in the project area; no sanctuaries or refuges will be affected by the project action. No wetlands or mudflats will be affected by the project actions. No vegetated shallows, coral reefs, or riffle and pool complexes will be affected by the proposed actions.

Threatened and endangered species use of, or existence in, the project area is discussed in the environmental assessment. No impacts or effects to endangered species are anticipated.

Other wildlife, such as the river otter, muskrat, and beaver, which would move through and around the project areas would only be affected to the extent of travel disruption. No food chain or critical habitat requirements will be affected by the proposed actions.

PROPOSED PLACEMENT SITE DETERMINATIONS

The mixing zone for discharge of rock fill will be the water column, approximately 20 feet deep in the pool and tailwater areas immediately adjacent to the dam. Dam gates will be closed sequentially to allow floating plant access to the construction site. This is anticipated to reduce current velocity and turbulence in order to facilitate fill placement. Depending on river conditions, this discharge may take several weeks to complete. The lack of fine particulates typically contained in rock fill indicates negligible chemical or turbidity effects resulting from this action.

Water quality standards for Iowa are represented on tables B-3 and B-4. Test results indicate that ammonia and unionized ammonia nitrogen are the most likely water quality standards which may be violated by the project activity. However, the proposed dredging and placement methods for material containing all contaminants are expected to minimize contaminant reintroduction to the water column.

The proposed project should have no effect on municipal or private water supplies, recreational or commercial fisheries, or water-related recreation. Aesthetics are generally negatively affected by any type of construction activity; however, for this project, no permanent effects are anticipated due to the nature of the project (maintenance and repair) and the location of placement sites.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Due to the inhospitable benthic environment above and below Dam 16, the placement of rock fill and capstone in this area is expected to stabilize part of the local substrate. This stabilization effort should provide crevices and interstices in which certain aquatic organisms can feed and reproduce. In terms of habitat diversity, therefore, scour protection will have a net positive effect on the aquatic ecosystem.

Terrestrial placement of fine material from the emergency lock area and sand material from scour protection excavation are anticipated to produce

negligible effects on the aquatic ecosystem. Removal of accreted sediments from the aquatic ecosystem at the subject facility may be considered to be beneficial.

DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No secondary effects on the aquatic ecosystem are anticipated. This determination is subject to reevaluation, if warranted by Federal, State, or local agency comment, as well as input from the general public.

SECTION 3 - FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

1. No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.

2. Evaluation of Practicable Alternatives. Refer to EA Sections III and VII.

A. No Federal Action. This alternative was not selected because:

(1) Sediment removal from each emergency/auxiliary lock is necessary for rehabilitation activities in both the emergency/auxiliary and main locks.

(2) Excavation for scour protection is necessary for additional stabilization of the dam structure substrate.

B. Proposed Actions. The proposed actions are considered environmentally and economically acceptable as planned. Placement sites and dredging methodology have been selected to reduce water quality impacts as well as impacts to the riverine system. Sites for placement are primarily upland or non-aquatic in nature. Materials discharged will be chemically and physically stable.

3. Permits, certification, or waiver of certification under Section 404 of the Clean Water Act will be obtained before construction begins. The projects will be in compliance with water quality requirements of the States of Iowa and Illinois.

4. The projects are not anticipated to introduce significant quantities of toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.

5. No significant impact to Federal or State-listed endangered species will result from the proposed actions.

6. The project is situated along an inland freshwater stream system. No marine sanctuaries are involved or would be affected by the proposed actions.

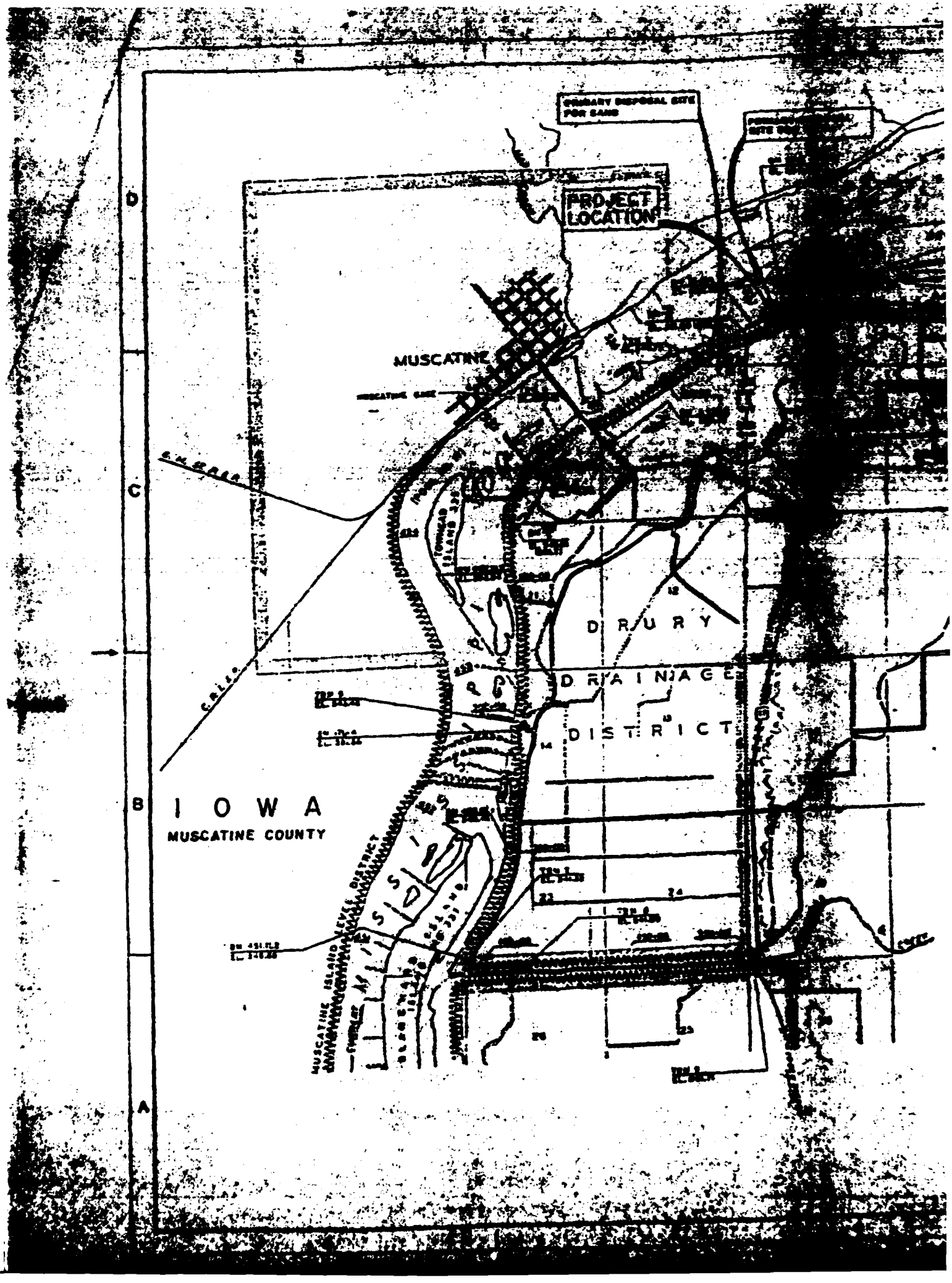
7. No municipal water supplies will be affected by the proposed actions, and no degradation of waters of the United States is anticipated to result from the proposed actions.

8. The materials used for construction will be chemically and physically stable and noncontaminating. Dredged materials are currently proposed to be placed for beneficial use (levee repair of reverberation).

9. No other practical alternatives have been identified. The proposed actions are in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed actions will not significantly impact water quality and will improve the integrity of an authorized navigation system.

_____
Date

John R. Brown
Colonel, U.S. Army
District Engineer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MUSCATINE
D R U R Y
D R A I N A G E
D I S T R I C T
I O W A
MUSCATINE COUNTY
MUSCATINE ISLAND LEVEE DISTRICT
S I D
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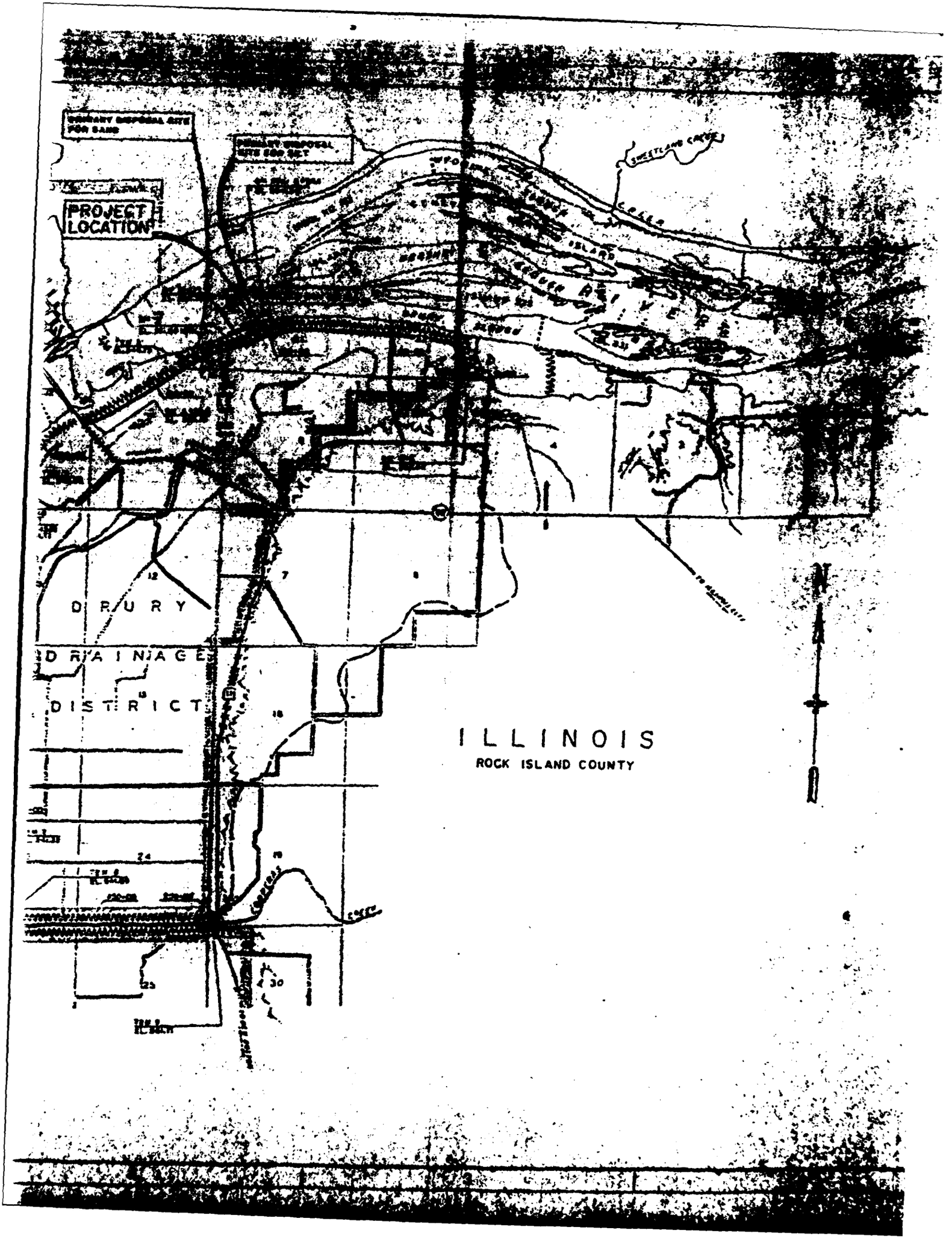
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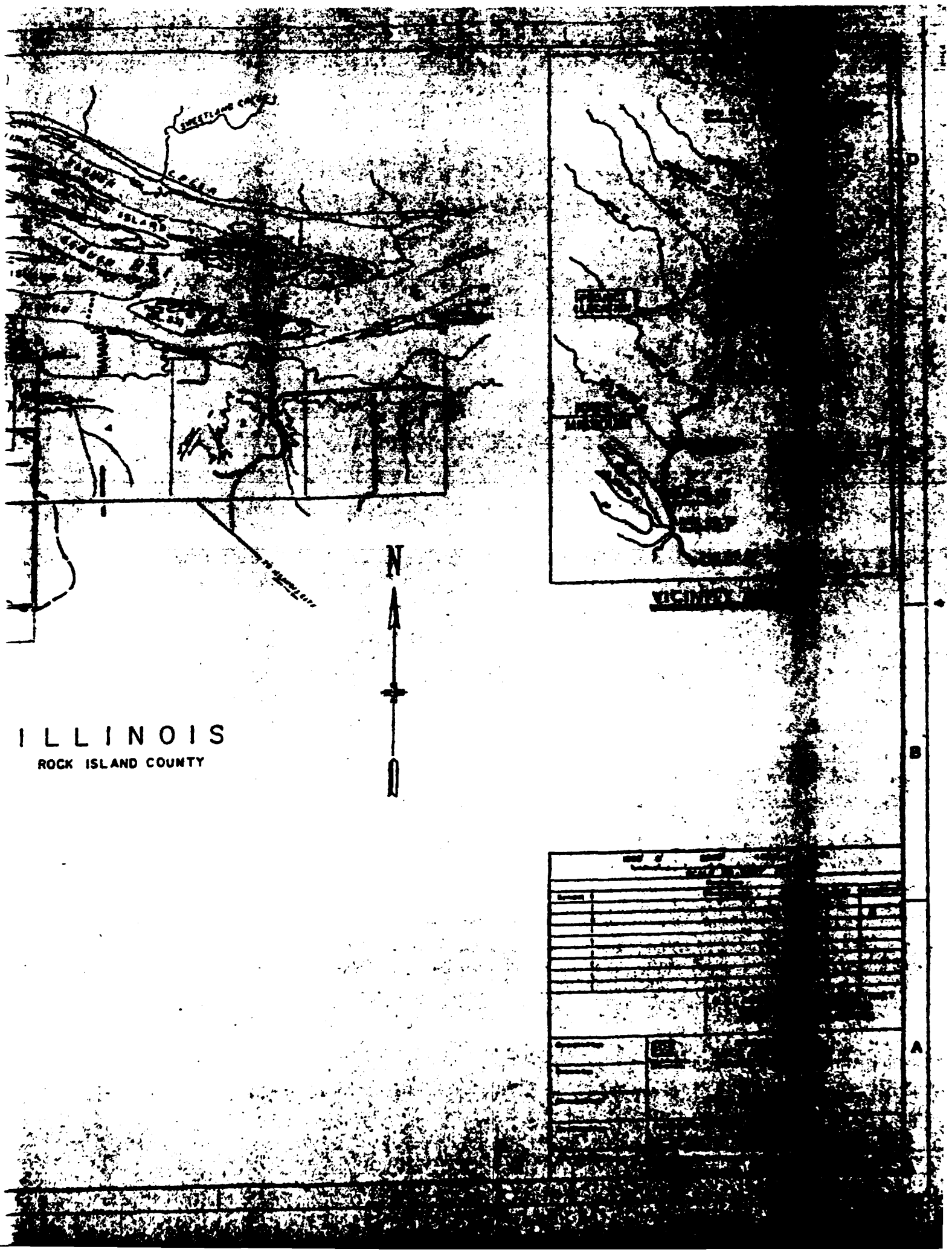
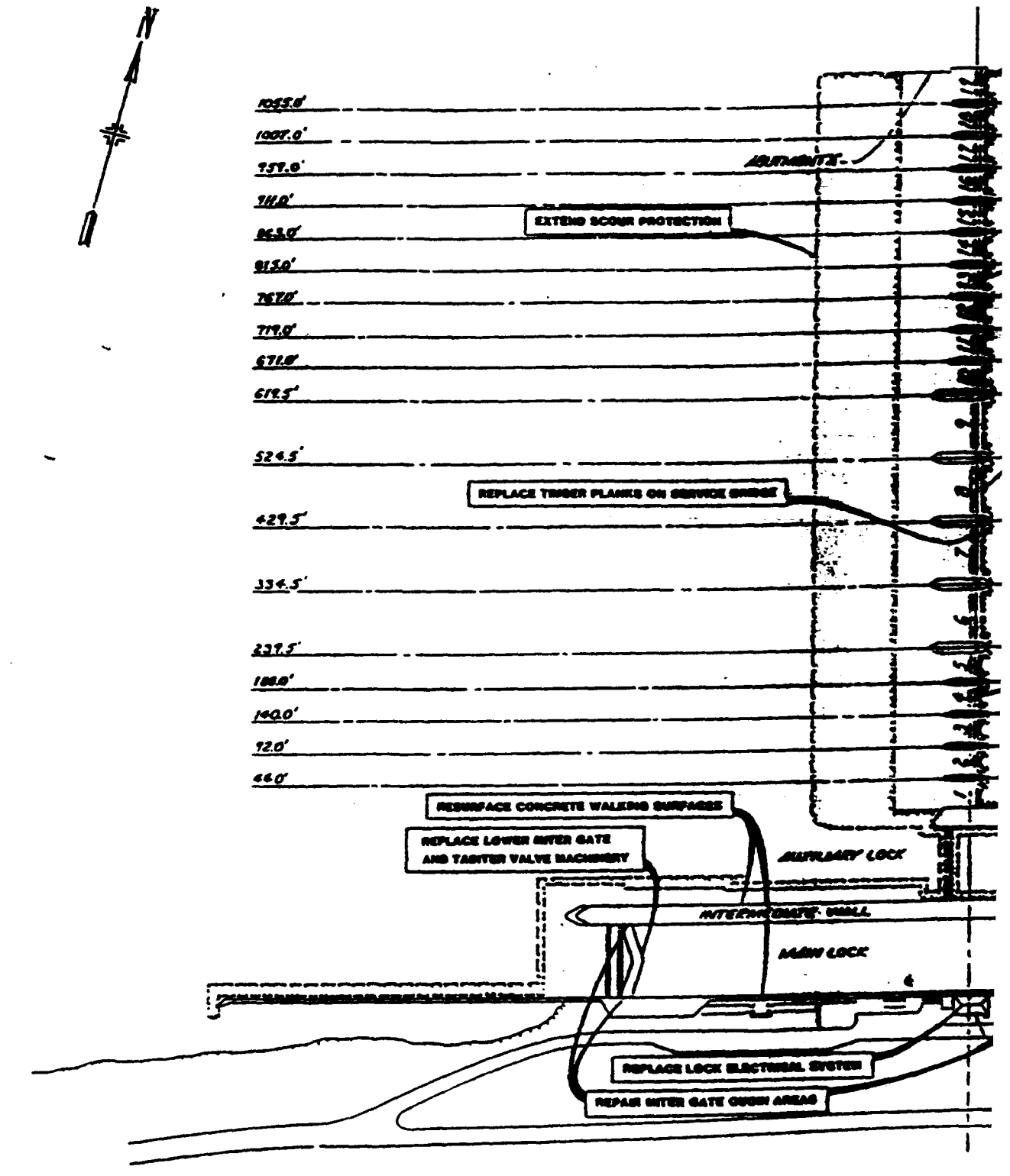
DISTRICT
ILLINOIS
ROCK ISLAND COUNTY



ILLINOIS

ROCK ISLAND COUNTY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911.0'
EXTEND SCOUR PROTECTION
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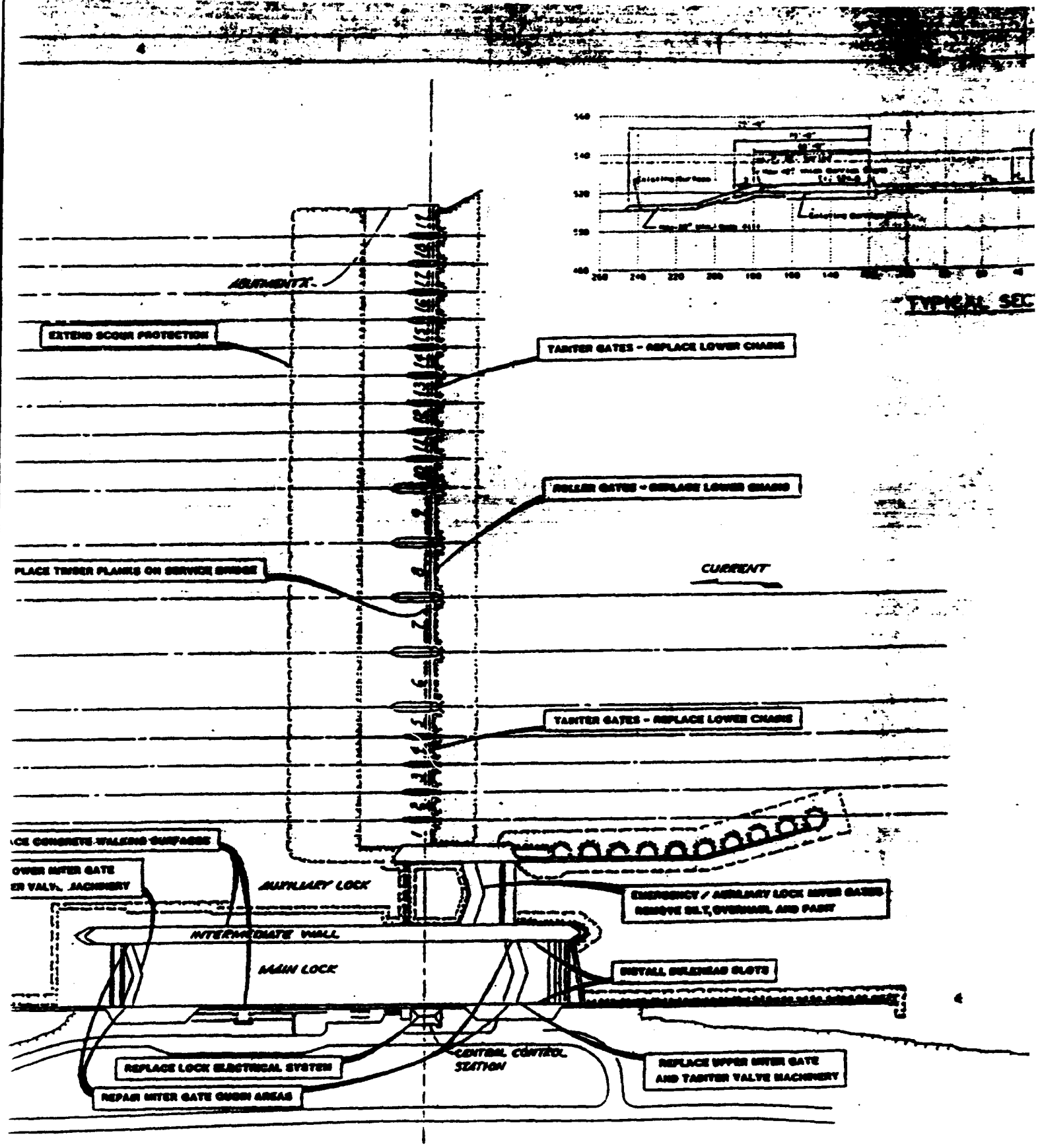
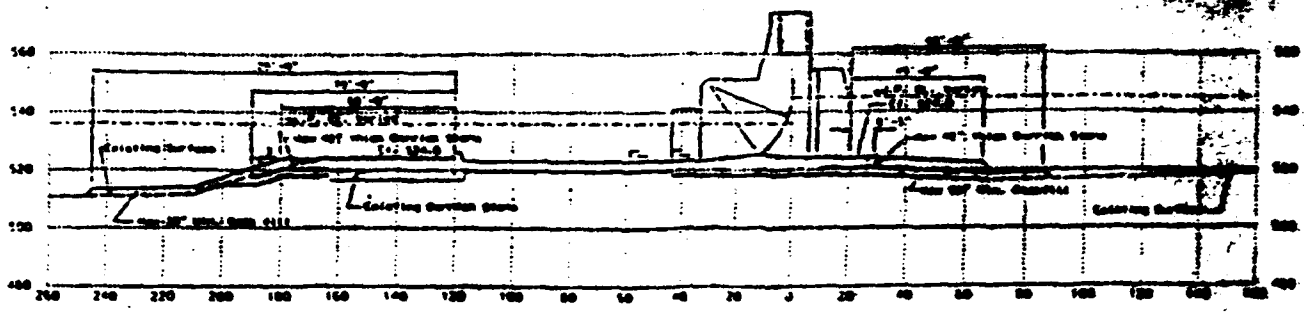
719.0'
671.0'
619.5'
524.5'
REPLACE TIMBER PLANKS ON SERVICE BRIDGE
429.5'
334.5'
239.5'
188.0'
140.0'
92.0'
44.0'
RESURFACE CONCRETE WALKING SURFACES
REPLACE LOWER INTER GATE AND TAINTER VALVE MACHINERY
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
REPLACE LOCK ELECTRICAL SYSTEM
REPAIR INTER GATE CHAIN AREAS
5
4
D
C
B
A

PLAN


ABUTMENT
EXTEND SCOUR PROTECTION
TAINTER GATES - REPLACE LOWER CHAINS
ROLLER GATES - REPLACE LOWER CHAINS
PLACE TIMBER PLANKS ON SERVICE BRIDGE
CURRENT
TAINTER GATES - REPLACE LOWER CHAINS
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
EMERGENCY / AUXILIARY LOCK MITER GATES
REMOVE SILT, OVERHANG, AND PAINT
INSTALL DRAINAGE SLOTS
REPLACE LOCK ELECTRICAL SYSTEM
REPAIR MITER GATE QUOIN AREAS
CENTRAL CONTROL STATION
REPLACE UPPER MITER GATE AND TAINTER VALVE MACHINERY

PLAN



TYPICAL SECTION

TAINTER GATES - REPLACE LOWER CHORD

ROLLER GATES - REPLACE LOWER CHORD

CURRENT

TAINTER GATES - REPLACE LOWER CHORD

EMERGENCY / AUXILIARY LOCK MITER GATES
REMOVE SILT, OVERBURDEN AND PAINT

INSTALL SHEARHEAD SLOTS

REPLACE UPPER MITER GATE
AND TAINTER VALVE MACHINERY

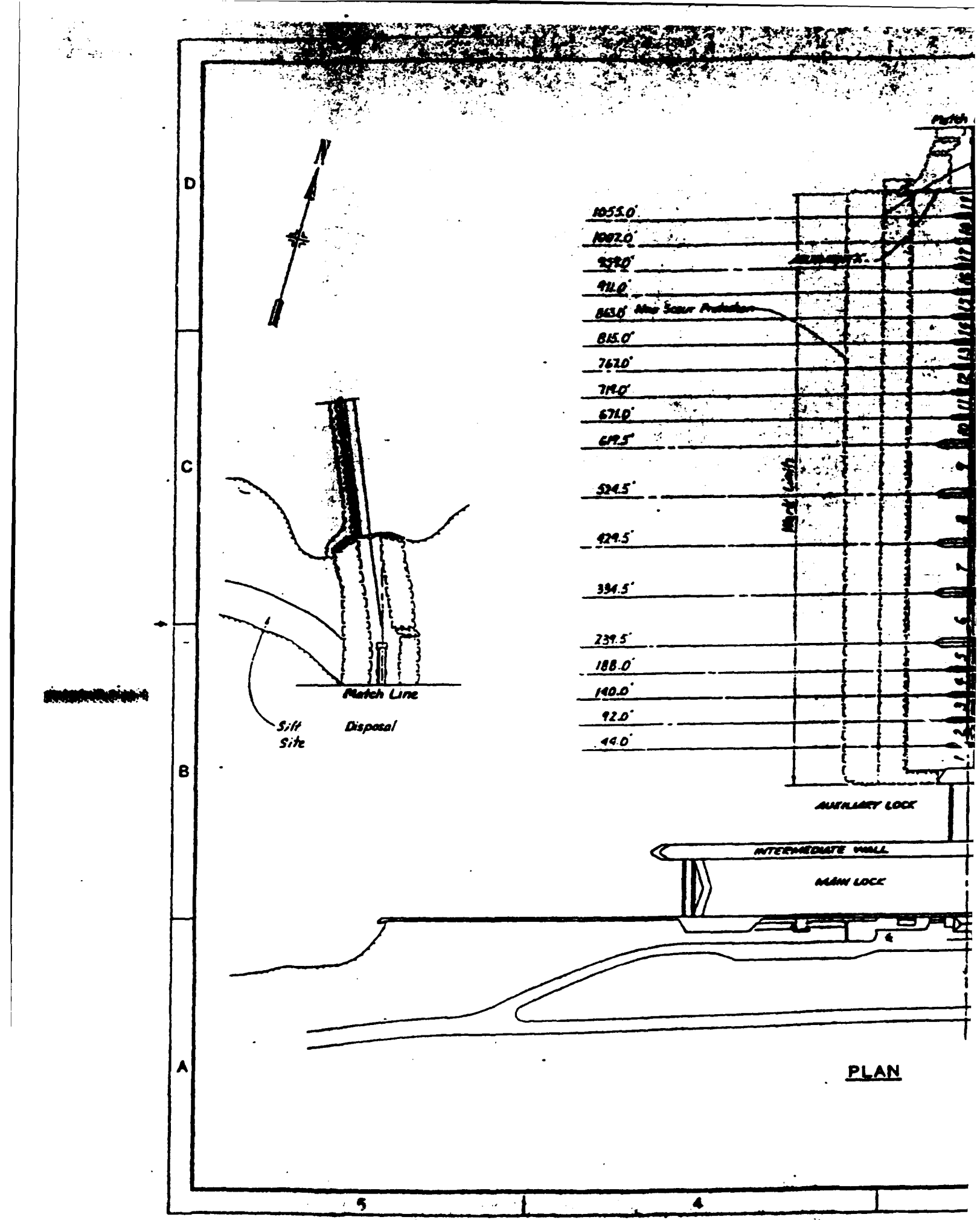
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

LOCK AND DAM NO. 19
MAJOR REHABILITATION

GENERAL PLAN

Scale: 1" = 100'

PLATE 2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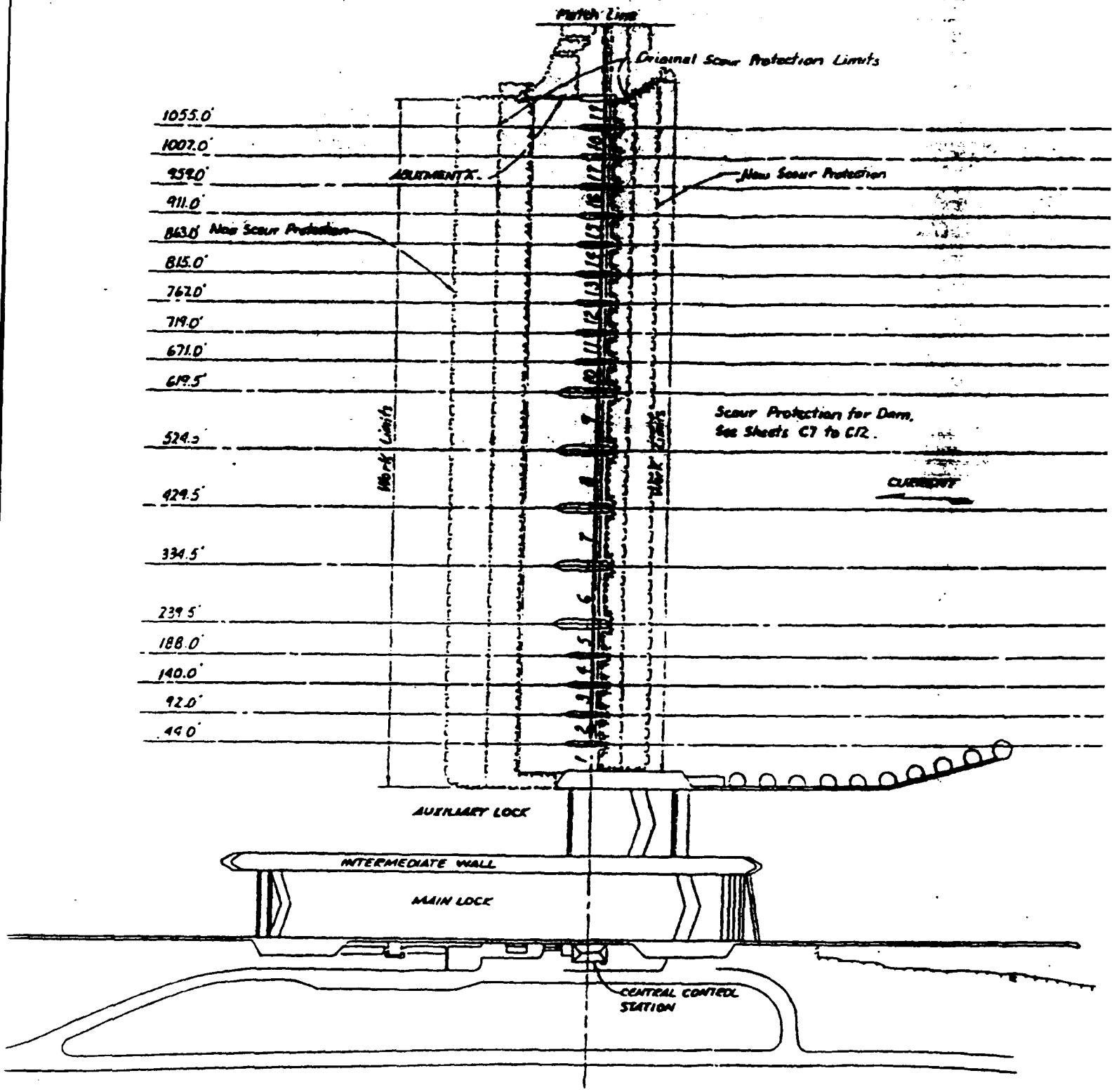
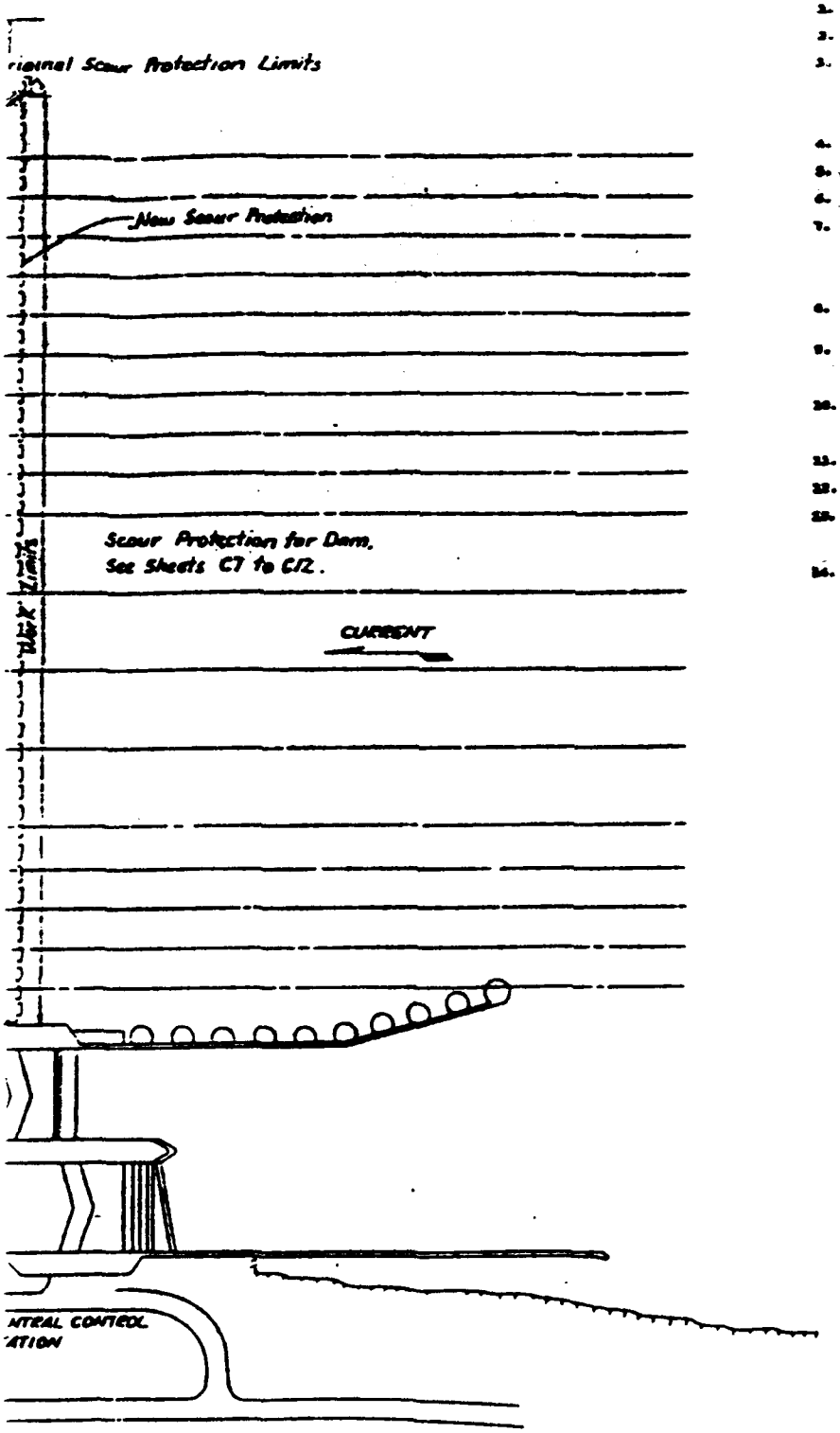
911.0'
863.0'
815.0'
767.0'
719.0'
671.0'
619.5'
524.5'
429.5'
334.5'
239.5'
188.0'
140.0'
92.0'
44.0'
Match Line
Silt Site
Disposal
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
PLAN


Patch Line
Original Scour Protection Limits
1055.0'
1007.0'
959.0'
ABUTMENT 'X'
New Scour Protection
911.0'
863.0' New Scour Protection
815.0'
767.0'
719.0'
671.0'
619.5'
524.0'
Scour Protection for Dam,
See Sheets C7 to C12.
CUMBERLAND
429.5'
334.5'
239.5'
188.0'
140.0'
92.0'
44.0'
AUXILIARY LOCK
INTERMEDIATE WALL
MAIN LOCK
CENTRAL CONTROL STATION

PLAN



[redacted]

U.S. ARMY ENGINEER DISTRICT
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ROCK ISLAND, ILLINOIS

F.R.J.
J.W.C.
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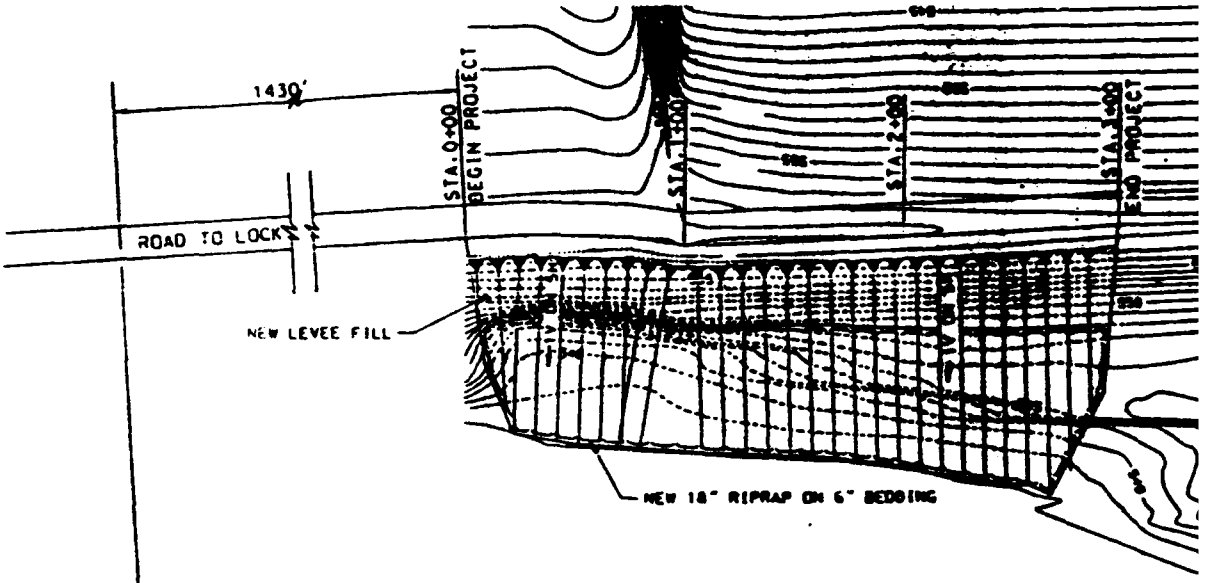
D.L.L.

LOCK AND DAM NO. 14
MAJOR MAINTENANCE
STAGE I
GENERAL PLAN

1" = 100'
27 AUG 1998
C3

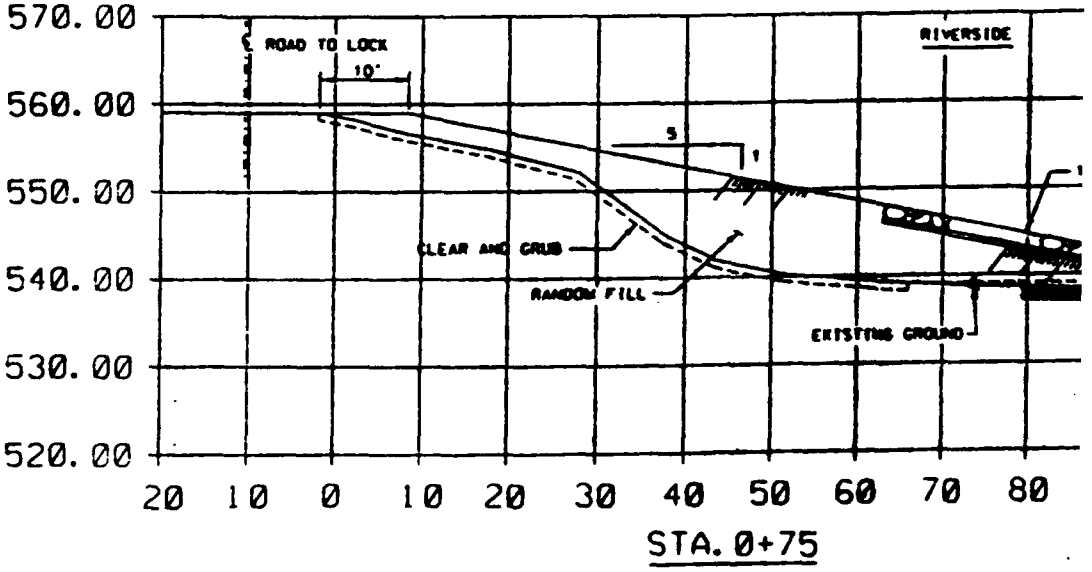
PLATE 5



PLAN

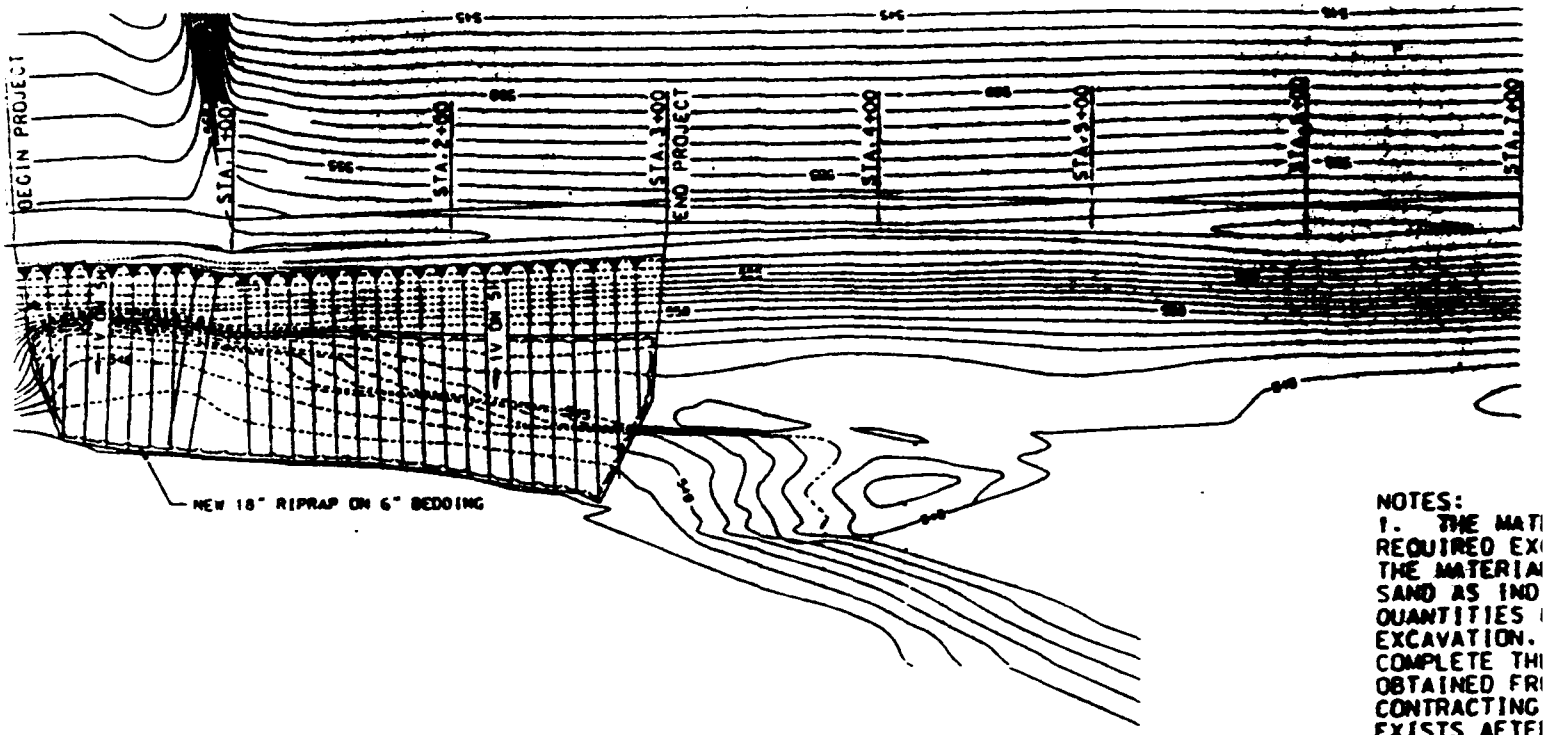
MISSISSIPPI RIVER

FLOW



STA. 0+75

TYPICAL SECTION



PLAN

NOTES:
1. THE MATI
REQUIRED EX
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QUANTITIES
EXCAVATION.
COMPLETE THI
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CONTRACTING
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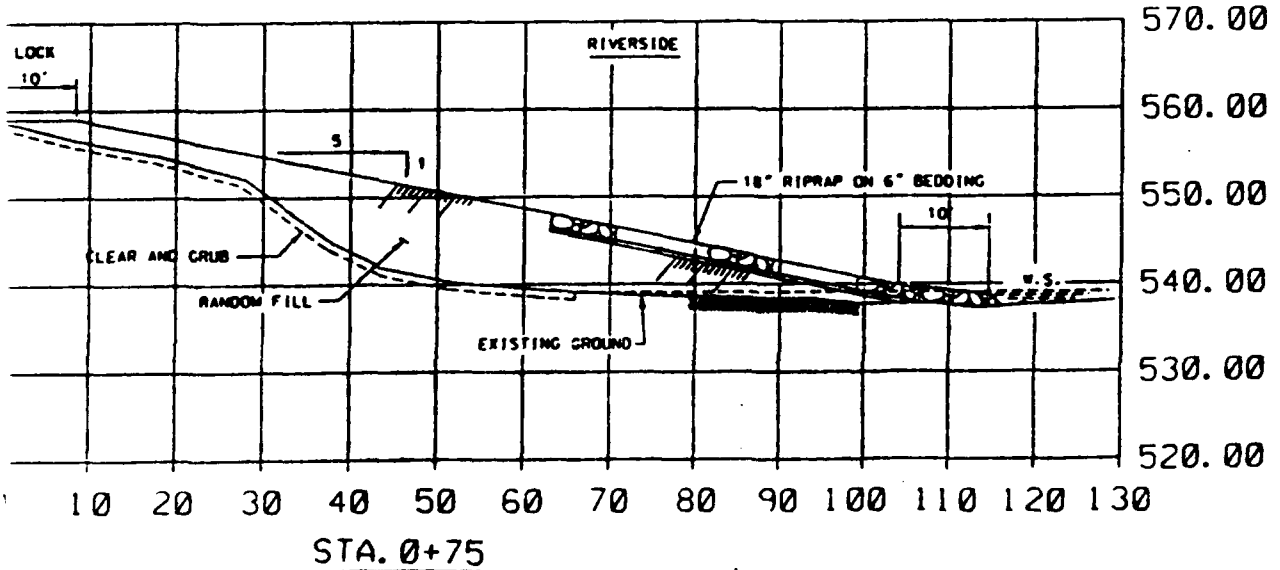
2. THE LEVI
TO NAVIGATI
ACCESS ROAD
3. THE ROC
THE EXISTIN
4. THE TAI
DATA SHEETS

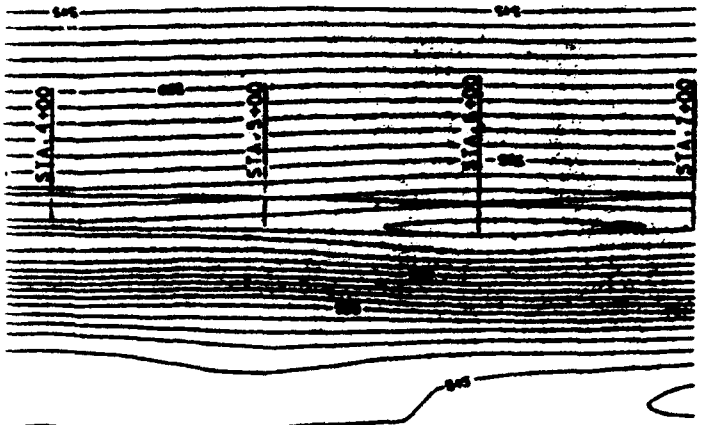
PI RIVER

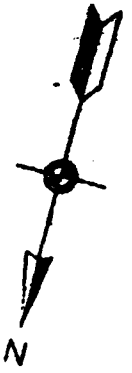
W



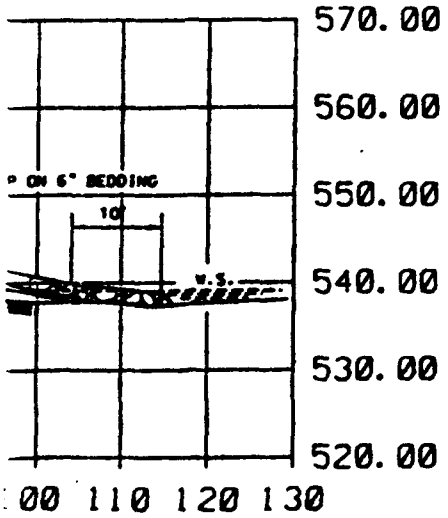
STA. 0+75

TYPICAL SECTION





NOTES:
1. THE MATERIAL FOR THE LEVEE REPAIR SHALL COME FROM THE REQUIRED EXCAVATION FOR THE ADDITIONAL SCOUR PROTECTION. THE MATERIAL TO BE USED IN THE LEVEE REPAIR SHALL BE CLEAN SAND AS INDICATED IN THE SPECIFICATIONS. IF INSUFFICIENT QUANTITIES OF SAND ARE OBTAINED FROM THE REQUIRED EXCAVATION, ADDITIONAL SAND MAY HAVE TO BE EXCAVATED TO COMPLETE THE LEVEE REPAIRS. THIS ADDITIONAL SAND SHALL BE OBTAINED FROM AREAS BELOW THE DAM AS APPROVED BY THE CONTRACTING OFFICER. IF A SURPLUS OF EXCAVATED MATERIAL EXISTS AFTER COMPLETION OF THE LEVEE REPAIR, THIS MATERIAL SHALL BE PLACED IN THE SECONDARY DISPOSAL SITE.
2. THE LEVEE REPAIR SHALL BE COMPLETED WITHOUT INTERFERENCE TO NAVIGATION TRAFFIC OR LOCAL VEHICULAR TRAFFIC ON THE ACCESS ROAD TO THE LOCK.
3. THE ROCK PLACEMENT ON THE LEVEE REPAIR SHALL TIE INTO THE EXISTING RIPRAP AT APPROXIMATE STATION 0+00.
4. THE TAILWATER IS SUBJECT TO FLUCTUATIONS. SEE HYDRAULIC DATA SHEETS C3 TO C6 FOR DETAILS.



Symbol	Revisions Description	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

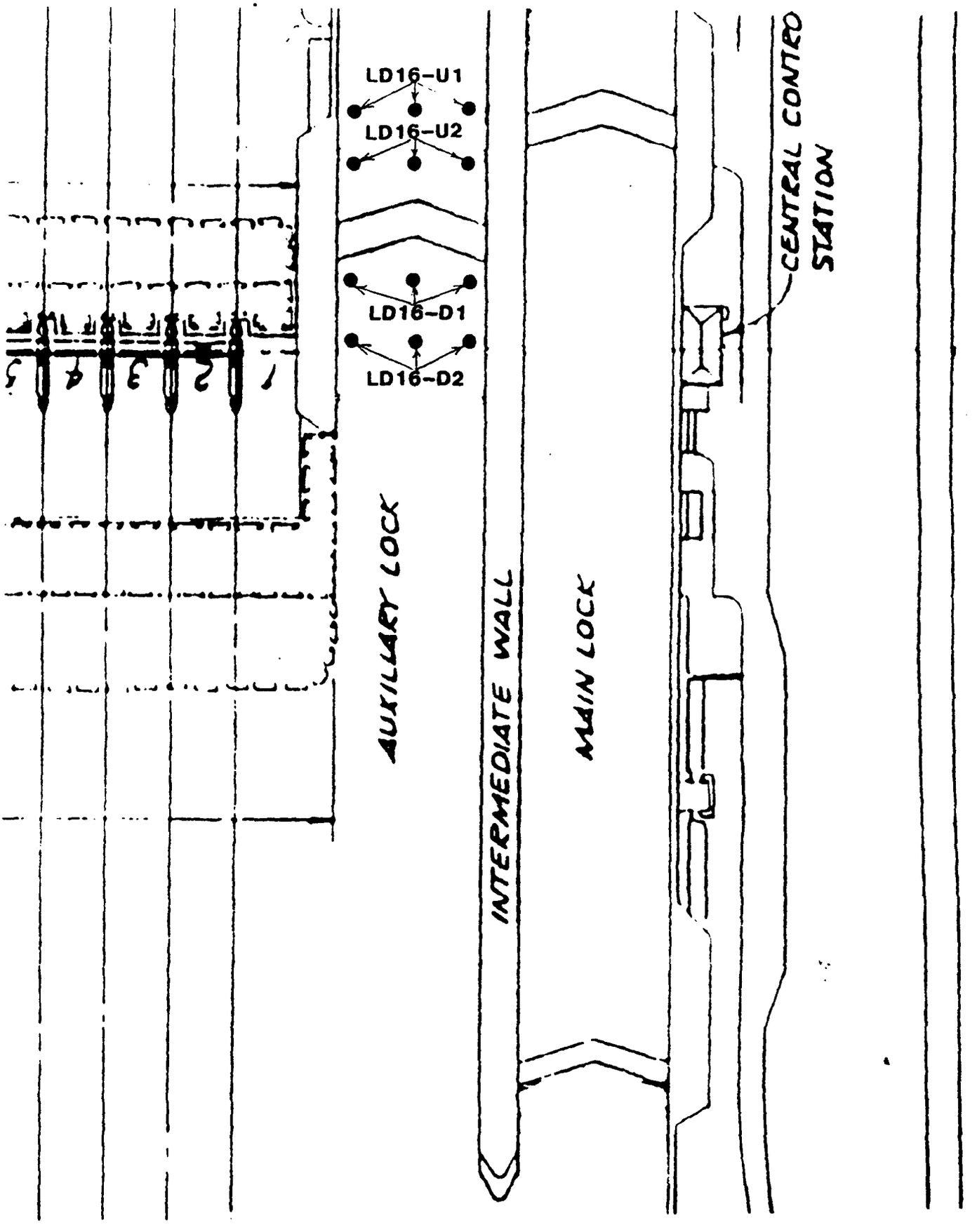
Designed by
Drawn by
Checked by
Reviewed by

MISSISSIPPI RIVER
LOCK AND DAM NO. 16
MAJOR RAHABILITATION
STAGE I

LEVEE REPAIR

Scale 1"=40'
Date 00 XXX 90

PLATE 4



L/D 16 water and sediment sampling locations.

Plate 5.

APPENDIX C

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